

Clough, V.S.
1943

Analysis of mental imagery in children's silent reading

BOSTON UNIVERSITY
SCHOOL OF EDUCATION

LIBRARY

Ed.

The Gift of Miss V. S. Clough.....

Thesis
Clough, V.S.
1943

stored

Thesis
Clough, V. S.
1943

Stored

BOSTON UNIVERSITY
SCHOOL OF EDUCATION

Thesis

AN ANALYSIS OF MENTAL IMAGERY IN CHILDREN'S SILENT READING

Submitted by

Vida Stevens Clough

(A. B., Bates College, 1919)

In partial fulfillment of requirements for
the degree of Master of Education

1943

First Reader: Donald D. Durrell, Professor of Education

Second Reader: Helen Blair Sullivan, Assistant Professor of Education

Third Reader: M. Agnella Gunn, Assistant Professor of English

Boston University
School of Education
Library

G. & V. S. Clough
School, Education
Aug. 31, 1943
24207

CONTENTS

CHAPTER		PAGE
	ACKNOWLEDGMENTS	i
	INDEX OF TABLES	ii
I	INTRODUCTION AND STATEMENT OF PROBLEM	1
II	HISTORICAL BACKGROUND OF PRESENT DISCUSSION	4
	REVIEW OF RELATED STUDIES	4
	WHAT IS MENTAL IMAGERY?	13
	IMAGERY TYPES	15
	INDIVIDUAL DIFFERENCES AND KINDS OF IMAGES	17
	MENTAL IMAGERY IN CHILDREN	22
	SEX DIFFERENCES	23
	FUNCTIONS OF MENTAL IMAGERY	25
III	CONSTRUCTION OF EXPERIMENT	29
	MATERIAL	29
	SUBJECTS	37
	TESTS	38
	METHOD	44
	SCORING THE TESTS FOR MENTAL IMAGERY	48
IV	DESCRIPTION AND ANALYSIS OF DATA	54
V	INTERPRETATIONS AND IMPLICATIONS	89
VI	SUMMARY AND CONCLUSIONS	114
	APPENDIX	117
	BIBLIOGRAPHY	128

ACKNOWLEDGMENTS

Deep appreciation and grateful acknowledgment is made to Dr. Donald D. Durrell, Dean of the School of Education and Professor of Education at Boston University, for his constant encouragement, assistance, suggestions, and criticisms throughout this entire investigation.

Gratitude and indebtedness is also expressed to the superintendents, principals, teachers and pupils who so cheerfully cooperated in order that this study might be made.

Vida Stevens Clough

UNIVERSITY

These reports and studies

in view of the fact that the

Education and Professor of Education at Eastern University

for his constant encouragement, assistance, suggestions

and criticism throughout this entire investigation.

Grateful and indebtedness is also expressed

to the respondents, particularly, teachers and pupils

who so generously assisted in the study.

Wish to thank

Wish to thank

INDEX OF TABLES

TABLE		PAGE
I	DISTRIBUTION ACCORDING TO SEX AND GRADE OF THE 470 PUPILS IN THIS STUDY	37
II	SCALE FOR MEASURING MENTAL IMAGERY IN SILENT READING OF THE 470 PUPILS	50
III	COMBINED SCORES IN MENTAL IMAGERY OF 470 PUPILS IN GRADES IV, V AND VI	55
IV	INDIVIDUAL DIFFERENCES IN MENTAL IMAGERY SCORES BY GRADE LEVELS	56
V	SCORES IN MENTAL IMAGERY INDIVIDUAL REPORTS (ORAL) VERSUS GROUP TEST (WRITTEN)	58
VI	SEX DIFFERENCES IN MENTAL IMAGERY SCORES BY GRADE LEVELS	60 & 61
VII	MENTAL IMAGERY SCORES OF 470 PUPILS ON THE INDOOR SELECTION VERSUS THE OUTDOOR SELECTION	64
VIII	105 CASES OF MENTAL AGE VERSUS MENTAL IMAGERY	66
IX	175 CASES OF READING AGE VERSUS MENTAL IMAGERY	68
X	READING GROUPING (A, B AND C) VERSUS MENTAL IMAGERY..	70
XI	LIKING TO READ VERSUS MENTAL IMAGERY (HISTOGRAM)	72
XII	LIKING TO READ VERSUS MENTAL IMAGERY	73
XIII	AMOUNT OF FREE READING VERSUS MENTAL IMAGERY	75
XIV	SCORES IN MENTAL IMAGERY BY PUPILS WHO PREFERRED MOVIES VERSUS SCORES BY PUPILS WHO PREFERRED THE RADIO	77
XV	SCORES IN MENTAL IMAGERY BY PUPILS WHO PREFERRED TO READ THEIR OWN STORIES VERSUS PUPILS WHO PREFERRED TO HEAR STORIES READ	79

TABLE OF CONTENTS

TABLE	PAGE
I	1
II	2
III	3
IV	4
V	5
VI	6
VII	7
VIII	8
IX	9
X	10
XI	11
XII	12
XIII	13
XIV	14
XV	15
XVI	16
XVII	17
XVIII	18
XIX	19
XX	20
XXI	21
XXII	22
XXIII	23
XXIV	24
XXV	25
XXVI	26
XXVII	27
XXVIII	28
XXIX	29
XXX	30
XXXI	31
XXXII	32
XXXIII	33
XXXIV	34
XXXV	35
XXXVI	36
XXXVII	37
XXXVIII	38
XXXIX	39
XL	40
XLI	41
XLII	42
XLIII	43
XLIV	44
XLV	45
XLVI	46
XLVII	47
XLVIII	48
XLIX	49
L	50
LI	51
LII	52
LIII	53
LIV	54
LVI	55
LVI	56
LVI	57
LVI	58
LVI	59
LVI	60
LVI	61
LVI	62
LVI	63
LVI	64
LVI	65
LVI	66
LVI	67
LVI	68
LVI	69
LVI	70
LVI	71
LVI	72
LVI	73
LVI	74
LVI	75
LVI	76
LVI	77
LVI	78
LVI	79
LVI	80
LVI	81
LVI	82
LVI	83
LVI	84
LVI	85
LVI	86
LVI	87
LVI	88
LVI	89
LVI	90
LVI	91
LVI	92
LVI	93
LVI	94
LVI	95
LVI	96
LVI	97
LVI	98
LVI	99
LVI	100

INDEX OF TABLES (cont.)

TABLE		PAGE
XVI	ASSOCIATIONAL RECALL VERSUS IMAGERY SCORE	81
XVII	PREFERENCE IN KIND OF STORIES VERSUS IMAGERY SCORE	83
XVIII	35 WHO DIDN'T LIKE TO READ VERSUS AMOUNT OF READING	
	VERSUS KIND OF READING	
	VERSUS ASSOCIATIONAL RECALL	85
XIX	26 PUPILS WHO PREFERRED THE FUNNIES VERSUS AMOUNT OF READING	
	VERSUS ASSOCIATIONAL RECALL	
	VERSUS LIKING TO READ	87

(1900) DEPT. OF COM.

NAME

DATE

10

.....

10

11

.....

11

12

.....

12

13

.....

13

14

15

16

CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

CHAPTER I

INTRODUCTION AND STATEMENT OF PURPOSE

CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

In the past, hypotheses have been made regarding causes for the individual's possession of mental imagery in silent reading, yet little data has been collected and tabulated showing the accompaniments of mental imagery, correlating abilities, skills, interests, and possibilities for its development through training.

Mental imagery shall be thought of throughout this discussion as the percept in the mind's eye which accompanies silent reading and includes visual, auditory, olfactory, gustatory, kinesthetic, and miscellaneous imagery.

In this particular investigation the writer is not concerned with the permanence, quality, placement, or fluctuation of the image except as spontaneous remarks are made and recorded.

The purpose of this study is to present data which will attempt to answer the following questions:

1. Is there any relation between mental age and mental imagery?
2. Are pupils who are keen in one or two types of mental imagery equally keen in all types?
3. Can a child get a mental image from reading one type of reading selection and yet not get an image from another type?

CHAPTER I

INTRODUCTION AND STATEMENT OF PROBLEM

In the past, hypotheses have been made regarding causes for the individual's possession of mental imagery in silent reading. The literature has been collected and tabulated showing the occurrence of mental imagery, particularly in relation to the type of material, the type of subject, and the type of task. The purpose of this study is to determine the relation between the type of material, the type of subject, and the type of task and the occurrence of mental imagery. The purpose of this study is to determine the relation between the type of material, the type of subject, and the type of task and the occurrence of mental imagery.

In this particular investigation the relation is not concerned with the type of material, the type of subject, or the type of task. The purpose of this study is to determine the relation between the type of material, the type of subject, and the type of task and the occurrence of mental imagery.

The purpose of this study is to determine the relation between the type of material, the type of subject, and the type of task and the occurrence of mental imagery.

1. Is there any relation between mental age and

mental imagery?

2. Are subjects who are high in one or two types of

mental imagery equally high in all types?

3. Can a child get a mental image from reading one

type of reading material and not get it from

another type?

4. If such is the case is there any relation between a child's experience and his mental imagery?
5. Are there any significant differences of mental imagery in any one grade, four, five, or six?
6. Is there any difference between the mental imagery of boys and girls?
7. Is there any relation between a child who does not like to read and mental imagery?
8. Is there any relation between the amount of reading and mental imagery?
9. Would a child who prefers movies or the radio have a better score in mental imagery?
10. Would a child who prefers to read his own stories or have some one read to him have a better score in mental imagery?
11. Is there any relation between associational recall and degree of imagery?
12. Is there any relation between reading age and mental imagery?
13. Is there any relation between ability grouping in reading and mental imagery?
14. Can a way be found for constructing a scale which will measure mental imagery?

4. Is there any relation between a child's experience and his mental history?
5. Are there any significant differences of mental history in any one grade, from five, or six?
6. Is there any difference between the mental history of boys and girls?
7. Is there any relation between a child who reads and his mental history?
8. Is there any relation between the amount of reading and mental history?
9. Would a child who prefers stories on the radio have a better story in mental history?
10. Would a child who prefers to read his own stories or have some one read to him have a better score in mental history?
11. Is there any relation between recreational recall and history of history?
12. Is there any relation between reading and mental history?
13. Is there any relation between ability in reading and mental history?
14. Can any be found for constructing a scale which will measure mental history?

From the foregoing questions it is apparent that this study has as main purposes:

1. An attempt to construct a scale which will measure the extent and degrees of mental imagery present in the silent reading of pupils in grades four, five, and six.
2. Discovery of relationships which may determine some of the specific factors that show positive, or negative, or no correlation with a high or low degree of mental imagery present in silent reading.

CHAPTER II

HISTORICAL BACKGROUND OF PRESENT DISCUSSION

CHAPTER II

HISTORICAL BACKGROUND OF THE PROBLEM

CHAPTER II

HISTORICAL BACKGROUND OF PRESENT DISCUSSION

Review Of Related Studies

The study of mental imagery and experiments with it extend for long periods into the past. As long ago as Aristotle the recognition of images played a part in mental processes. Investigation of mental imagery, chiefly visual imagery, was begun by Fechner in 1860.^{1/} Many researches have followed, but of the early pioneers no one has approached the problem with the thoroughness and magnitude of Galton who began his work in 1880.^{2/}

By means of the famous Galton questionnaire, he investigated the visual imagery of 100 men. By individual interrogation he examined the imagery of a large number of men, women, and children, the exact number of which is not known. Through the cooperation and help of school teachers, he discovered much about the vividness of mental imagery of school children. He dealt exclusively with imagery of objects - concrete imagery, as distinguished from verbal - and reported great variations in the vividness, clearness, and permanence of the images of individuals. He very strongly believed that

^{1/} Gustav I. Fechner, Elemente der Psychophysik, Breitkopf and Härtel, Leipsig, 1860, p. 3.

^{2/} Francis Galton, Inquiries into Human Faculty and Its Development, Macmillan & Co., London, 1883, p. 89.

the power of visualization could be developed by education.^{1/}

No attempt in this study will be made to present a critical survey of all previous research in the field of mental imagery. Madison Bentley in his monograph on Mental Imagery gives a splendid history of early studies^{2/}, and Wilfred Lay in his doctor's dissertation from Columbia reviews in a complete manner all investigations of this subject made up to 1898.^{3/}

Lay made a study of mental imagery, a comparison between visual and auditory images, through a combination of subjective and objective methods. Lay^{4/} read aloud to 100 college men and women a paragraph calculated to suggest visual and auditory images, then asked them to write down all they could remember of it. From the words they used, Lay calculated the percentage of both visual and auditory images.

Lay^{5/} also sent out a questionnaire, patterned partially after the one by Galton, to 125 well-known painters of New York City, to discover if they had a higher power of visualization than ordinary people.

1/ Ibid., p. 105.

2/ Madison Bentley, "The Memory Image," American Journal of Psychology, (October, 1899), XI, pp. 1-48.

3/ Wilfrid Lay, Mental Imagery Experimentally and Subjectively Considered, Doctor's Dissertation, Columbia University, 1898, pp. 47-54.

4/ Ibid., p. 6.

5/ Ibid., p. 16.

In addition, Lay^{1/} made a study of the consonants used by Shelley, Thompson, Browning, and others in their poetical works, and calculated from them their types of imagery.

He concluded that there are great individual differences in visual and auditory images^{2/}; that painters do not have any extraordinary power in recalling visual images^{3/}; that there are great differences in the possession of word imagery^{4/}; that word-articulatory imagery seems to be the cause of some of the mistakes in writing (such as the substitution of a b for a p), particularly those which would not be mistakes if the pronunciation were slightly altered^{5/}; and that the spontaneous quality of our mental imagery should be developed.^{6/}

Most of the early investigations dealt with voluntary imagery or the ability to evoke certain specified images at will. Very little attention had been given to a study of spontaneous imagery, or the normal functioning of imagery in mental processes.

^{1/} Wilfrid Lay, op. cit., p. 25.

^{2/} Ibid., p. 11.

^{3/} Ibid., p. 16.

^{4/} Ibid., p. 40.

^{5/} Ibid., p. 44.

^{6/} Ibid., p. 59.

However, in 1909, George Betts^{1/} divided his study between investigation of voluntary imagery and spontaneous imagery.

Using the questionnaire method, supplemented by personal interviews, Betts, in four experiments, using college students as subjects, investigated voluntary imagery.

For the first experiment he used 46 Cornell College students, for the second, 34 Cornell College students, for the third, 45 Teachers College students, and for the fourth, 18 psychologists.

Betts developed a method of scoring. The college students rated their own imagery as being very clear and vivid, good, fair, faint, or none at all. Betts scored these five classifications, after the student judged his own imagery, as one, two, three, zero, and five, in order named above. He then multiplied the number rating by the number of cases which came under it, and thus arrived at a score.^{2/}

In his experiment with voluntary imagery he found that 26 percent had very clear images, 32 percent good images, 24 percent fair images, 13 percent faint images, and only 5 percent no images.^{3/} He, likewise, found a slight positive correlation with ability in imagery and ability in college studies^{4/}; a marked

^{1/} George H. Betts, Distributions and Functions of Mental Imagery, Doctor's Dissertation, Columbia University, 1909, p.10.

^{2/} Ibid., p. 45.

^{3/} Loc. cit.

^{4/} Loc. cit.

However, in 1909, George Botwin divided his study between investigation of voluntary imagery and automatic imagery. Being the quantitative method, experiments by automatic imagery, Botwin, in 1909, experiments, using college students as subjects, investigated voluntary imagery.

For the first experiment he used 48 Cornell College students, for the second, 54 Cornell College students, for the third, 48 Teachers College students, and for the fourth, 18 psychologists.

Botwin developed a method of scoring. The college students were divided into two groups as being very slow and rapid. Each group, of course, at all, Botwin scored these five classifications, after the student gave 10 trials, as one, two, three, four, and five, in order from slow to fast. He then multiplied the number rating by the number of cases which came under it, and then arrived at a score.

In his experiment with voluntary imagery he found that 35 percent had very fast images, 55 percent good images, 10 percent fair images, 15 percent below images, and only 5 percent no images. In his, likewise, found a slight positive correlation with ability in imagery and ability in college studies.

In George B. Botwin, *Voluntary and Automatic Imagery*, New York, 1909, Columbia University, 1909, p. 10.

2/100, cit.
3/100, cit.
4/100, cit.

difference between "voluntary imagery in college students and those specialists more advanced in thought who are dealing with abstract lines of thought"^{1/}; and visual imagery lower than other types.^{2/}

In the second part of his experiment, in the investigation of spontaneous imagery, he used both the methods of interrupted and uninterrupted thinking in questioning a total of 198 college students. These students were apportioned for interrogation among five tests. The student was given a certain number of seconds to write down the names of as many things as came to his mind in a given number of seconds, at a stated time, to show his visual, auditory, and other kinds of imagery.

Betts concluded that thinking goes on without intervention of imagery; that "imagery often serves as a background for the meaning with which we are dealing, but it cannot be said to be essential"; that most people can command more imagery than they normally employ in their thinking; and that imagery functions most in our thinking when our thought is baffled and also at times when percepts would be of great assistance.^{3/}

^{1/} Loc. cit.

^{2/} George H. Betts, *Ibid.*, p. 46.

^{3/} *Ibid.*, p. 94.

Mabel Fernald^{1/}, in 1912, using both the subjective and objective method in testing, made a study of both verbal imagery and object imagery through the testing individually of five men and six women. Fernald gave tests in spelling, pronunciation of words, description of words, and drawing, which were memory tests. She was the first person, to the writer's knowledge, to report a study of imagery in connection with silent reading.^{2/} Twenty-one short passages of prose and poetry were used, some abstract in type and some concrete. These were typewritten and read silently by the subject, who was then asked to reproduce the contents, and was examined individually in order to get introspective data. Different rates in reading were allowed for different passages in order to determine whether rapidity was correlated with the use of any particular form of imagery.

She concluded that certain individuals have very distinct and accurate imagery belonging to a given sensory field, while others make little use of any imagery^{3/}; that "the individual differences in imagery are too complex to be stated adequately in terms of type"^{4/}; that "visualizers are more rapid readers than

^{1/} Mabel R. Fernald, Diagnosis of Mental Imagery, Doctor's Dissertation, University of Chicago, 1912, p. 130.

^{2/} Ibid., p. 24.

^{3/} Ibid., p. 128.

^{4/} Ibid., p. 130.

and objective method in testing, made a study of both verbal
 imagery and object imagery through the testing individually of
 five men and six women. Formals gave tests in spelling,
 pronunciation of words, description of words, and drawing,
 which were memory tests. The one the first person, to the writer's
 knowledge, to report a study of imagery in connection with object
 reading. Twenty-one short passages of prose and poetry were
 used, some abstract in type and some concrete. These were
 typewritten and read silently by the subject, who was then asked
 to reproduce the contents, and was repeated individually in order
 to get introspective data. Different rates in reading were allowed
 for different passages in order to determine whether rapidity was
 correlated with the use of the particular type of imagery.
 The results that certain individuals have very
 distinct and accurate imagery relating to a given sensory field,
 while others have little use of any imagery, that "the individual
 differences in imagery are too complex to be stated adequately in
 terms of type," that "visualizers are more vivid readers than

W. L. Fernald, *Psychology of Verbal Imagery*, Boston's
 Association, University of Chicago, 1912, p. 100.

3/1915, p. 64.

3/1915, p. 128.

4/1915, p. 133.

others, since they are not delayed by the auditory-vocal-motor accompaniment"; on the whole, that "there is a greater tendency to respond to a suggestion of visual imagery than to one for any other sensory field"^{1/}; that the "majority of persons are auditory or auditory-vocal-motor for words, but predominantly visual in their non-verbal thinking".^{2/} While Fernald's conclusions are very interesting, too few subjects were used to warrant assurance in her data.

In 1919, Charles H. Griffitts^{3/} made a study to discover the nature and extent of individual differences in imagery. He used 112 college men and women, beginning students in psychology, as subjects. His experiment, divided into four periods, using three periods for individual tests and one period for small group tests, investigated both concrete imagery, the frequency of the different kinds of imagery, and the quantitative aspect of verbal imagery. He concluded that in the concrete field, visual imagery nearly always ranks first, but that in the verbal field, inner speech ordinarily predominates^{4/}; that the sex differences

^{1/} Mabel R. Fernald, *Ibid.*, p. 46.

^{2/} *Ibid.*, p. 48.

^{3/} Charles H. Griffitts, Individual Differences in Imagery, Doctor's Dissertation, University of Michigan, 1919, p. 14.

^{4/} *Ibid.*, p. 72.

others, since they are not delayed by the auditory-motor loop
 "accompanying"; on the whole, this "error" is a greater tendency
 to respond to a suggestion of visual imagery than to one for any
 other sensory field. The "latency" of response is usually
 or auditory-motor - other for words, but predominantly visual in
 their non-verbal thinking. This verbal's conclusions are very
 important, too, for subjects who used to respond mainly in
 their data.

In 1916, Charles A. Orlitzky made a study to discover
 the nature and extent of individual differences in imagery. He
 used 112 college men and women, beginning students in psychology,
 as subjects. His experimental, divided into two periods, making
 three periods for individual tests and one period for small
 group tests, investigated both concrete imagery, the frequency
 of the different kinds of imagery, and the qualitative aspect of
 verbal imagery. He concluded that in the concrete field, visual
 imagery is nearly always present, but that in the verbal field,
 there is a marked tendency to be absent, that the two different

IV. Verbal Imagery, *ibid.*, p. 45.

IX. *ibid.*, p. 46.

X. Charles A. Orlitzky, *Individual Differences in Imagery*,
 Doctor's Dissertation, University of Toronto, 1917, p. 14.

XI. *ibid.*, p. 42.

are small^{1/}; and that the term imagery type is misleading, for there was no evidence to assume that an individual belonged to a distinct type, such as a visual or auditory type.^{2/}

Until recent years all the surveys have been confined to a study of voluntary or spontaneous imagery, subjective or objective research, the proof of the presence of imagery, the existence of many types of imagery, the relation and correlation of kinds, percentage distribution showing diversity of images in individuals, permanence and clarity of images, sex differences, memory images of objects, places, persons previously seen, and images of all types which arise from stimuli given in various forms.

Marjorie Brennan^{3/}, in 1938, investigated imagery differences in relation to children's silent reading. Three paragraphs from basal readers were presented, both orally and in written form, to fifty-three fifth and sixth grade children. Stimulus words were used for each paragraph according to the free written association technique; the responses were analyzed and arranged to show the extremes and range. A stimulus sentence

^{1/} Ibid., p. 19.

^{2/} Ibid., p. 66.

^{3/} Marjorie C. Brennan, A Study of Children's Imagery in Visual and Auditory Comprehension, Unpublished M. Ed. Thesis, Boston University, 1938.

was also presented to a fourth, fifth, and sixth grade followed by controlled responses. She found wide ranges in the imagery of the group of children tested regarding vividness, color, size of objects and people, appearance of objects, people, animals, scenery, and the time element.

This study was followed by one in 1939 by ^{rv}Adra Wavle^{1/} who continued an investigation of imagery in silent reading by her study of fifty-one adults and two children.

The subjects read silently three carefully selected passages, then, after the reading, in a personal interview she questioned, in an objective manner, each person regarding his imagery.

She found that practically all possessed visual imagery, whereas only about half the number reported auditory imagery; that there was great variation in permanence, clarity, quality, and color of the visual image; that there were wide differences in other kinds of imagery^{2/}; and that the capacity for imagery varied not so much according to subject matter as according to the interest in the subject matter.^{3/}

1/ Adra S. Wavle, A Study of Mental Imagery in Silent Reading, Unpublished M. Ed. Thesis, Boston University, 1939, pp. 1-74.

2/ Ibid., p. 30.

3/ Ibid., p. 61.

was also presented as a factor, 15 sec, and sixth grade followed by controlled responses. The third side was in the category of the group of children tested regarding vocabulary, color, size of objects and people, arrangement of objects, people, animals, scenery, and the time shown.

This study was followed by one in 1933 by Mrs. Davis who continued investigation of factors in child reaction by her study of thirty-one white and two children.

The subjects read differently from carefully selected pictures, then, after the reading, in a personal interview she questioned, in an objective manner, each person regarding his imagery.

She found that practically all possessed visual imagery, whereas only about half the subjects reported auditory imagery; that there was great variation in responses, clarity, quality, and color of the visual image; that there were wide differences in other kinds of imagery; and that the capacity for imagery varied not so much according to subject matter as according to the interest in the subject matter.

IV Mrs. S. Davis, A Study of Visual Imagery in Fifth Grade Children, unpublished, M. A. thesis, Boston University, 1933, pp. 1-44.

2. Total, p. 30.

2. Total, p. 61.

In order to set the stage, so to speak, for this study, the writer will present a review of expression of opinion on pertinent topics.

What Is Mental Imagery?

According to Dr. Arthur I. Gates, "no one knows precisely what imagery is, on what mechanism it depends or how to examine it accurately in children."^{1/}

Others have made an attempt to define it.

"Imagery is a name for concrete mental processes taken in their immediate and varied individualities. Distinct images are emphasized portions of this process what James designates substantive states. Series of images constitute the imagery of separate moments as emphasized factors arise and pass away," observes MacLennan.^{2/}

^{1/} Arthur I. Gates, The Psychology of Reading and Spelling, Teachers College, Columbia University, New York, 1922, p. 99.

^{2/} S. F. MacLennan, "The Image and the Idea," Psychological Review, (April, 1922), IX, p. 69.

In order to see the stage, as to which, for this study, the writer will present a review of expression of opinion on pertinent topics.

What is Mental Imagery?

According to Dr. Arthur I. Gates, "no one knows precisely what imagery is, or what constitutes it, though it is so essential in education."¹ Others have made an attempt to define it. Imagery is a term for concrete mental processes taken in their immediate and varied individualization. Distinct images are experienced portions of the process that forms the material of mental activity. Series of images constitute the imagery of narrative events as experienced through sense and sense memory." "Concrete Imagery,"²

¹ Arthur I. Gates, The Psychology of Reading and Writing, Macmillan Company, New York, 1927, p. 22.

² E. C. Lindholm, "The Image and the Idea," Psychological Review, (April, 1922), 11, p. 63.

Hicks gives us this thought. "Some so called 'images', certain visual and auditory images more especially seem to stand over against the apprehending subject and to be for him objects in space, no less decidedly than the physical things of nature seem to stand over against him and to be for him objects in space."^{1/}

A rather unique definition is given by Lay who states, "Mental imagery might finally be defined as the content of our mind when we have no sensation but yet are not asleep; when we are alone in the dark, in complete silence, and oblivious of the chair or bed or bit of ground on which we happen to be sitting, lying, or standing".^{2/}

Although an attempt at definition is difficult, and although mental imagery is illusive of precise description, yet by means of the attributes, potentialities, and accompaniments of mental imagery, one can discern its presence. Research has established its existence. Why individuals possess it remains for future investigations.

^{1/} G. Dawes Hicks, "On the Nature of Images," British Journal of Psychology, (October, 1924), XV, p. 125.

^{2/} Wilfrid Lay, op. cit., p. 3.

Imagery Types

Through a study of differences in imagery one unconsciously becomes better aware of its nature.

Most of the investigators following Galton have seemed to indicate that the individual with little visual imagery must have predominance of imagery of another sort which is clear. Galton, however, did not agree with this viewpoint.^{1/}

This doctrine of imagery types and marked individual differences followed Galton's studies.

"There seems to be no doubt that the great majority of students are predominantly visual," reports Titchener.^{2/}

MacLennan reported that the images "vary in character and coloring to an indefinite degree, although typical forms predominate in each of us."^{3/}

Many of the early investigators were very positive that an individual belonged to either one type or another and were thus classified as visual, or auditory.

1/ Francis Galton, op. cit., p. 50.

2/ Edward B. Titchener, A Textbook of Psychology, Macmillan & Co., New York, 1921, p. 59.

3/ S. F. MacLennan, op. cit., p. 69.

Inventory Types

Through a study of differences in inventory one
unconsciously become better aware of the nature.
That of the investigator following Galton have
been to indicate that the individual with little visual imagery
must have predominance of memory of another sort which is clear.
Galton, however, did not agree with this viewpoint.
This description of imagery types and mental individual
differences followed Galton's studies.
"There seems to be no doubt that the great majority
of students are predominantly visual," reports this work.
The authors reported that the degree "very in character
and coloring to an individual degree, although typical forms
predominate in each of us."
Many of the early investigators were very positive
that an individual belonged to either one type or another
and were thus classified as visual, or auditory.

W. Dill, *op. cit.*, p. 80.

W. Dill, *op. cit.*, p. 80.

W. Dill, *op. cit.*, p. 80.

It appears to the writer that of the recent investigators in this field, Fernald has summarized in a very clear manner the present opinion regarding types. Research substantiates her conclusions.

"We have been forced to conclude, therefore, that the individual differences in imagery are too complex to be stated adequately in terms of 'differences in type,' unless this type is carefully explained for each individual case. It would be a difficult task to pick visual, auditory, or motor types from among our subjects, although it is easy to discover certain ones who make much use of visual imagery, of auditory or motor, and others who use little or none of a given form. We have found that all of our subjects use with readiness at least two forms and most of them use more."^{1/}

Griffitts, also reporting in recent years, concurs with Fernald in her opinion regarding types. "The results," he declares, "show great differences but there is little, if any, evidence for types."^{2/}

^{1/} Mabel R. Fernald, op. cit., p. 130.

^{2/} Charles H. Griffitts, op. cit., p. 14.

It appears to the writer that of the recent investigators in this field, Oswald has presented in a very clear manner the present opinion regarding type. Research substantiated her conclusion.

"Oswald has been forced to conclude, therefore, that the individual differences in the way in which the individual is affected by the type of 'disturbance' in the type is a very important factor in the type. It would be a difficult task to find a visual, auditory, or motor type from among the subjects, although it is easy to place certain ones who are subject to visual imagery, of auditory or motor, and others who are little or none of a given type. We have found that all of our subjects are with weakness at least two forms and most of them are two." Griffiths, also reporting in recent years, concurs with Oswald in her opinion regarding type. "The results," he declares, "show great differences but there is little, if any, evidence for type."

1. Oswald, E. J., *op. cit.*, p. 120.

2. Griffiths, E. J., *op. cit.*, p. 121.

Individual Differences And Kinds Of Images

There is much evidence to support the theory that there are great individual differences in mental imagery. There is diversity of opinion whether power in visual or auditory imagery predominates, no agreement regarding sex differences, or adult imagery versus imagery of children.

Betts^{1/} finds visual imagery lower than other types.

Armstrong^{2/}, using the Galton questionnaire in studying imagery of 188 college students, finds visual imagery greatly in excess of other types.

However, French^{3/}, likewise in studying college students, 118 Vassar juniors, through using Titchener's questionnaire, finds no predominance of the power of visual imagery. He states, "The differences in mental imagery are almost entirely a matter of degree. All are able to call up visual, auditory and tactile images. Only one or two are lacking in either taste, smell, temperature, or motor images."^{4/}

^{1/} George H. Betts, op. cit., p. 46.

^{2/} A. C. Armstrong, "The Imagery of American Students," Psychological Review, (1894), I, p. 496.

^{3/} F. C. French, "Mental Imagery of Students," Psychological Review, (October, 1902), IX, p. 55.

^{4/} Loc. cit.

From this survey he concluded that "in most people the mind is capable by effort of all kinds of sense imagery, although, as a usual thing, its content is limited to one or two special forms."^{1/}

Valentine^{2/}, in studying the functions of images in appreciation of poetry, reports decided individual differences with a great range of capacity for imagery.

Galton's well-known researches carried out in 1875 with respect particularly to visual memory images, established once and for all the fact that there is extraordinary divergence among individuals in the power of visualizing.^{3/}

With respect to auditory imagery, Hicks declares it is far less frequent than visual imagery, but it is by no means infrequent. He gives this example. "There are persons who declare after having listened to a performance of the Passion Music of Bach that they can recall at will without difficulty in the silence of their homes exactly what they heard in the concert room."^{4/}

^{1/} F. C. French, op. cit., p. 56.

^{2/} A. W. Valentine, "Functions of Images in Appreciation of Poetry," British Journal of Psychology, (July, 1924), p. 169.

^{3/} Francis Galton, op. cit., p. 115.

^{4/} G. Dawes Hicks, op. cit., p. 135.

Vaughan says in reference to types of imagery that one sort of imagery may predominate in a given individual, but that, although one sort is more vivid than others, correlation not compensation is the rule. "A person who excels in one kind of imagery is apt, generally speaking, to excel in other kinds."1/

William James, by way of explanation of the different kind of images, says, "Images of taste, for example, occur in conjunction with some perception, the image of a sour taste may be occasioned by the sight of an unripe apple.

"The most vivid touch images come when we ourselves barely escape local injury, or when we see another injured.

"Olfactory images may arise, for example, when one is looking at a scentless carnation.

"Kinesthetic imagery is perhaps the least accessible of all imagery to exact inspection."2/

1/ Wayland F. Vaughan, General Psychology, Doubleday Doran Company, Inc., New York, 1936, p. 387.

2/ William James, Principles of Psychology, Henry Holt & Co., New York, 1927, pp. 65 and 66.

One of our recent investigators, Griffitts, concludes from the tabulation of his data that "Visual imagery ranks highest in clearness in 90% of the 87 cases, auditory in 5% and kinesthetic in 5%."^{1/} He declares that no subject with poor visual imagery has clear auditory imagery. Some with clear visual imagery have poor auditory. There is a positive correlation with clearness of visual and of auditory imagery.^{2/}

In a rather complete manner Lay has stated the kinds of images. "Under mental imagery I wish to place not only the images of the so-called five senses, but all the mental representations that are, in part or in entirety, the reflection or echo of the world of sensations.

- | | |
|--------------|-------------------------------------|
| 1. Visual | 6. Thermal |
| 2. Auditory | 7. Motor |
| 3. Tactile | 8. Those of pain (not touch) |
| 4. Gustatory | 9. Organic |
| 5. Olfactory | 10. Those of emotion" ^{3/} |

^{1/} Charles H. Griffitts, op. cit., p. 14.

^{2/} Loc. cit.

^{3/} Wilfrid Lay, op. cit., p. 4.

One of our recent investigators, Griffiths, concludes

from the tabulation of his data that "visual imagery ranks

highest in clearness in 50% of the 87 cases, auditory in 15

and kinesthetic in 3%." It is observed that no subject with

poor visual imagery has clear auditory imagery. Even with

clear visual imagery there may be poor auditory. There is a positive

correlation with clearness of visual and of auditory imagery.

In a rather complete manner I have tested the kinds

of images. "Under mental imagery I wish to place not only

the images of the so-called five senses, but all the mental

representations that are, in part or in entirety, the

reflection or echo of the world of sensations.

- | | |
|--------------|------------------------------|
| 1. Visual | 5. Thermal |
| 2. Auditory | 6. Motor |
| 3. Tactile | 7. Taste of pain (not touch) |
| 4. Gustatory | 8. Olfactory |
| 9. Olfactory | 10. Sense of emotion |

V. Griffiths, *Psychology*, vol. 1, p. 14.

2. *Psychology*, vol. 1, p. 14.

3. *Psychology*, vol. 1, p. 14.

There should be brief comments on the eidetic image.

Writers have believed that some people in addition to the usual visual image have the power to see an eidetic image. In the case of the visual memory image, the object is merely imaged, in the case of the eidetic image, the original object is seen.^{1/}

Allport believes that power for detecting eidetic images in children can be discovered through the portion of the Binet test, drawing designs from memory.^{2/}

Studies made show that approximately 60% of all children between 10 and 15 years of age are able to produce eidetic images. Ability usually retreats with advancing age.^{3/}

^{1/} G. W. Allport, "Eidetic Imagery," The British Journal of Psychology, (October, 1924), XV, p. 99.

^{2/} Ibid., p. 100.

^{3/} Ibid., p. 101.

Mental Imagery In Children

Many writers comment on the power of mental imagery in children.

Galton concluded that on the whole such imagery was more frequent in childhood than adult life. He said, "There is reason to believe that it is very high in some young children, who seem to spend years of difficulty in distinguishing between the subjective and objective world".^{1/}

This opinion is also affirmed by Betts. He says, "That children should employ much more imagery than adults in their thinking is wholly in accord with the mode of the mind's development. The child is much nearer the world of the concrete. The child's mental world is relatively a world of percepts, covering the range of all the senses".^{2/}

Drummond^{3/} believed children's drawings are a mode of expression which indicate the presence of visual images.

^{1/} Francis Galton, Statistics of Mental Imagery, Mind 1880, 5, p. 301.

^{2/} G. H. Betts, op. cit., p. 44.

^{3/} Margaret Drummond, "The Nature of Images," British Journal of Psychology, (July 1926), XVII, p. 15.

Sex Differences

Opinions vary regarding sex differences in imagery.

Galton decided from his experiments and individual investigations that "The power of visualizing is higher in the female sex than in the male, and is somewhat, but not much, higher in public schoolboys than in men. After maturity is reached, the further advance of age does not seem to dim the faculty, but rather the reverse, judging from numerous statements to that effect; but advancing years are sometimes accompanied by a growing habit of hard abstract thinking, and in these cases - not uncommon among those whom I have questioned - the faculty undoubtedly becomes impaired".^{1/}

According to Griffitts,^{2/} men are superior to women in the clearness of mental images. He reports the following differences:

	Visual	Auditory	Kinesthetic
Men	93.3	73.8	60.6
Women	75.6	62.3	56.5

^{1/} Francis Galton, op. cit., p. 99.

^{2/} C. H. Griffitts, op. cit., p. 13.

Sex Differences

Opinions vary regarding sex differences in language. Galton decided from his experiments and observations that "the power of visualization is higher in the female sex than in the male, and is somewhat, but not much, higher in public schoolboys than in men. When actually it is reached, the further removal of age it is not seen to diminish the faculty, and rather the reverse, judging from numerous statements to that effect; but advancing years are sometimes accompanied by a growing habit of hard work of thinking, and in those cases - not uncommon among those whom I have questioned - the faculty undoubtedly becomes impaired."

According to Billings, men are superior to women in the clearest of mental images. He reports the following differences:

	Visual	Imaginary	Algebraic
Men	82.2	78.2	80.2
Women	73.2	82.2	78.2

IV. Wundt, op. cit., p. 22.
V. C. R. Billings, op. cit., p. 12.

However, the students scored their own papers, so Griffiths modifies his report by stating "that it is evident either that the imagery of men is relatively superior to women, or that the women were more conservative, in grading images".^{1/}

In his conclusions, however, he states that the sex differences were very small, too small to draw any real conclusions.^{2/}

^{1/} Ibid., p. 13.

^{2/} Ibid., p. 69.

Functions Of Mental Imagery

Are images of distinct value to our mental processes? Most writers believe they have true functions and real purpose.

Galton^{1/} has stated that we can think without images as is the case of those occupied on mental work involving abstruse generalization and abstract thought.

"There can be memory and memory of a very reliable kind without any representation in the form of an image of what is remembered," declares Hicks.^{2/}

Betts^{3/} likewise states in his conclusions that thinking can and does go on without intervention of imagery.

All three writers stress the value of imagery in our mental life.

To Betts it is evident that most persons can command a far wider range of imagery than they normally employ in thinking.^{4/}

^{1/} Francis Galton, op. cit., p. 116.

^{2/} G. Dawes Hicks, op. cit., p. 136.

^{3/} George H. Betts, op. cit., p. 46.

^{4/} Loc. cit.

That people are privileged to enjoyment through mental imagery is surely one of its functions.

Many people whose imagery is ready and varied give themselves over to the enjoyment of images that come automatically in day dreams or in reading poetry or stories, declares Margaret Drummond.^{1/}

To Pear, "the memory world and the thinking world of a person who never uses visual imagery would seem comparable to the perceptual world of an animal without eyes."^{2/} Some individuals are more conscious than others that they have the power and pleasures of imagery.

Meaning and imagery are closely related. Ideas are always based in images MacLennan emphatically declares. "Lay the finger upon the concept and it melts away into images. --- We must next examine into the precise nature of the function which the image supports."^{3/}

^{1/} Margaret Drummond, op. cit., p. 10.

^{2/} T. H. Pear, "Privileges and Limitations of Visual Imagery," British Journal of Psychology, (April, 1925), XV, p. 363.

^{3/} S. F. MacLennan, op. cit., p. 70.

"When the precise imagery flashes into mind a distinct sense of relief comes over us. The more vivid the picture, the greater is our assurance. It is imagery which ensures a final realizing sense to ideation. --- Only when we realize the presence of imagery as the embodiment of symbols, and of reference as the spirit of control for imagery, can we understand the real nature of ideas and keep clear of the rocks on either hand which have such woe to thought."1/

Imagery does not always supply the correct idea or give the correct impression. A false concept supplies erroneous meaning and builds an erroneous image. This fact was brought out by Marjorie Brennan^{2/} who showed the great variance in children's mental constructs even in the same classroom. Under the writer's data more information will be added on this thought.

1/ S. F. MacLennan, op. cit., p. 79.

2/ Marjorie Brennan, op. cit.

"These images frequently are representative of incidents in the past of the subject and are often not at all appropriate; in the case of reading, they are often misrepresentations of the matter read. One can scarcely doubt that many children are victims of this automatic functioning of the associative process. The false tales told in good faith by many children are evidence of this."1/

Another proof of the "close dependence of meaning upon imagery is found in the constant resort to imagery when thought is baffled."2/

Lay^{3/} stresses the fact that the arousing of vivid mental images in the mind is of value not only in stimulating ideas and meaning but as an awakening of the finer emotions.

1/ Margaret Drummond, op. cit., p. 11.

2/ S. F. MacLennan, op. cit., p. 74.

3/ Wilfrid Lay, op. cit., p. 57.

CHAPTER II

CONSTRUCTION OF EXPERIMENT

CHAPTER III

CHAPTER III

CONSTRUCTION OF EXPERIMENT

CHAPTER III

CONSTRUCTION OF EXPERIMENT

Material

As previously stated, this study has as its main purposes:

1. An attempt to construct a scale which will measure the extent and degrees of mental imagery present in the silent reading of pupils in grades four, five, and six.

2. Discovery of relationships which may determine some of the specific factors that show positive, negative, or no correlation with a high or low degree of mental imagery present in silent reading.

The choice of subject matter was the next consideration. For the experiment with fourth, fifth, and sixth grade pupils, the writer chose the following material.

The selections were one or more paragraphs from a basal series of books, carefully graded for vocabulary, interest, and comprehension for the particular grade for which they were written. An indoor and outdoor passage, which appeared to offer variety in appeal, interest, amount and kinds of imagery, was selected for each grade from the following books. Each test had two parts, as indicated on the next page.

Grade IV - Gates-Ayer, Let's Look Around, The Macmillan Co. 1940
 Indoor (Bingo And The Angry Rooster)
 Outdoor (Adventures Of The Woodlawns)

Grade V - Gates-Ayer, Let's Travel On, The Macmillan Co. 1940
 Indoor (The Squirrel's Tale)
 Outdoor (His First Bee Tree)

Grade VI - Gates-Ayer, Let's Go Ahead, The Macmillan Co. 1940
 Indoor (Younger Brother Travels West)
 Outdoor (Meeting The Wild West Show)

The selections themselves follow.

GRADE IV - (Indoor Passage)

BINGO AND THE ANGRY ROOSTER - Helen Hill and Violet Maxwell
from LET'S LOOK AROUND - Gates-Ayer

At last Charlie had finished helping Mrs. Brown make the butter. They had taken it out of the churn. Mrs. Brown had put it in a big wooden bowl and beaten it with wooden butter paddles. She had put cold water on it so that all the buttermilk was squeezed and washed out.

She gave Charlie some butter in a smaller bowl so that he could finish making it by himself.

GRADE IV - (Outdoor Passage)

ADVENTURES OF THE WOODLAWNS - Carol Ryrie Brink
from LET'S LOOK AROUND - Gates-Ayer

With berries flying out of their buckets, the children fled down the hill. Over rocks and bushes, helter-skelter they ran. They did not stop till they reached the river bank. There they paused a moment for breath. Then they plunged in, clothes and all, with their buckets balanced on their heads. The river was not deep at this season. It did not take them long to cross.

GRADE V - (Indoor Passage)

THE SQUIRREL'S TALE - Christopher Morley
from LET'S TRAVEL ON - Gates-Ayer

There lay the unpleasant child, fast asleep;
and there in the next room was the beautiful Christmas
Tree. Parents and nurse had trimmed it well and gone
to bed tired out. From every fragrant bough hung
tinsel ornaments, peppermint canes, cornucopias, colored
bulbs, popcorn strings, shining trinkets.

PATENTS
FALCON BOND
PATENT

These are the names of the inventors of the

invention of the Falcon Bond Patent

and the names of the persons to whom the

same have been assigned

and the names of the persons to whom the

same have been assigned

GRADE V - (Outdoor Passage)

HIS FIRST BEE TREE - Charles Roberts
from LET'S TRAVEL ON - Gates-Ayer

One day, on an out-of-the-way corner of the mountain, the little black motherless bear cub, Teddy, stumbled upon a patch of late blueberries - large, plump, very blue, and juicy. He fairly forgot himself in his joy. How good those berries tasted!

He ate as fast and hard as he could. He did not take time to look where he was going. So it happened that, all of a sudden, he fell straight through a thick fringe of blueberry bushes and went rolling and clawing down the face of a steep rock.

He fell almost thirty feet and stopped with a bump that left him without breath enough for squealing. The ground was soft, however, and he had no broken bones. -----

It was a deep bowl, not more than forty feet across at the bottom. The rocky sides were so steep that Teddy Bear did not feel at all eager to climb them. -----

But his nose caught an odor that put all thought of escape out of his head.

Chapter 1 - (Introductory)

THE FIRST PART - The first part of the book is devoted to a general survey of the subject.

The first part of the book is devoted to a general survey of the subject. It is divided into three main sections: the first section deals with the history of the subject, the second section deals with the theory, and the third section deals with the practice. The first section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice.

The second section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice. The second section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice.

The third section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice. The third section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice.

The fourth section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice. The fourth section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice.

The fifth section is divided into three parts: the first part deals with the history of the subject, the second part deals with the theory, and the third part deals with the practice.

GRADE VI - (Indoor Passage)

YOUNGER BROTHER TRAVELS WEST - Laura Adams Arner
from LET'S GO AHEAD - Gates-Ayer

The boys spent the evening with the trader in his living room. It was a splendid big stone-walled room with Navaho blankets hanging on the walls and piled halfway to the ceiling in one end of the room. The floor was carpeted with the blankets. A big stone fireplace suggested cosy evenings in the winter time.

GRAND VI - (Interior - Entrance)

YOUNGER SON'S CHAMBER - (Entrance - East - West)
 From the East - East - West

The door opens into the corridor with the window

in the living room. It was a splendidly stone-

lined room with marble floors and a hanging on the wall

and filled with the old furniture to the end of the

room. The door was opened with the handle.

Old stone fireplace with a large chimney in

the center line.

GRADE VI - (Outdoor Passage)

MEETING THE WILD WEST SHOW - Carol Ryrie Brink
from LET'S GO AHEAD - Gates-Ayer

Martin and Henry ran here and there trying to see everything. It was bad enough trying to see everything that went on in the three rings of the show during the performance, but this was even worse. Things were being unloaded from all the cars, wagons were being assembled, cowboys and Indians were driving oxen and leading rearing, neighing ponies. Over in the meadow, Indian tepees were being pitched. In the midst of the field, the enormous show tent was going up with plenty of shouts and cries, grunts and swearing.

Subjects

The subjects of this survey were 470 pupils from grades four, five, and six living in two different cities and two different towns in widely separated areas of Massachusetts.

Approximately half the pupils came from average American families, a sprinkling came from superior homes, and nearly half from communities where there was a large foreign population, chiefly Portuguese, Greek, Italian, and French. It is thus observed the subjects were a fair cross section of our average school population.

Distribution according to sex and grade was as nearly uniform as possible as the figures in Table I indicate.

TABLE I. DISTRIBUTION ACCORDING TO SEX AND GRADE OF THE
470 PUPILS IN THIS STUDY

Grade	Boys	Girls	Total
IV	87	72	159
V	68	76	144
VI	77	90	167
Total	232	238	470

Subjects

The subjects of this survey were 470 pupils from grades four, five, and six living in two kindergarten classes and two fifth-grade classes in which a variety of ethnic groups were represented. Approximately half the pupils were from average American families, a substantial group from superior homes, and nearly half from communities where there was a large foreign population, chiefly Portuguese, Greek, Italian, and French. It is thus apparent the subjects were a fair cross-section of our average school population.

The following according to sex and grade was as nearly uniform as possible as the figures in Table I indicate.

TABLE I. DISTRIBUTION ACCORDING TO SEX AND GRADE OF THE 470 PUPILS IN THIS STUDY

Grade	Boys	Girls	Total
IV	81	77	158
V	88	76	164
VI	77	90	167
Total	246	224	470

GRADE IV - English Language

GRADE IV - English Language

Answer any questions

1. Do you like to read? Yes No

2. If you enjoy reading, what do you read most often? (Please write the name of the book or books you read most often.)

3. What kind of stories do you like best?

4. Do you like to play or work with other children?

5. Do you enjoy a play or story which is new to you? (Please write the name of the play or story.)

Tests For Grades IV, V, And VI

6. What do you enjoy most about reading a book, play, or story?

.....

GRADE V - English Language

1. Do you like to read? Yes No

2. If you enjoy reading, what do you read most often? (Please write the name of the book or books you read most often.)

3. What kind of stories do you like best?

4. Do you like to play or work with other children? (Please write the name of the play or story.)

5. Do you enjoy a play or story which is new to you?

6. What do you enjoy most about reading a book, play, or story?

7. Do you like to read? Yes No

8. If you enjoy reading, what do you read most often? (Please write the name of the book or books you read most often.)

9. What kind of stories do you like best?

10. Do you like to play or work with other children? (Please write the name of the play or story.)

Notes for October 17, 1912

GRADE IV - (Indoor Passage)

BINGO AND THE ANGRY ROOSTER

Introductory Questions

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books either from your school library or public library? Yes No
Number of books read this year
3. What kind of stories do you like best?
4. Do you like books better with or without pictures?
5. Do you enjoy a play or story better to see it as a motion picture or to listen to it over the radio?
6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

.

Part I - Report On Indoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of the room, locating all you see, or make a list of what is in your picture.
3. What colors do you see?
4. Do you see colors on objects or people? Name the colors and on what you see them.
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. How many people do you see? Ages
9. Clearest part of picture?
10. Does the picture remind you of any person you have seen, any place you have visited, any book read, or any movie seen?

GRADE IV - (Indoor Passage)

LINDA AND THE LARRY ROSSER

Introductory Questions

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books other than your school library or public library? Yes No
Number of books read last year:
3. What kind of stories do you like best?
4. Do you like books better with or without pictures?
5. Do you enjoy a play or story better to see it as a motion picture or to listen to it over the radio?
6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

.....

Part I - Report on Indoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a picture of the room, locating all you see, or make a list of what is in your picture.
3. What colors do you see?
4. Do you see colors on objects or people? Name the colors and on what you see them.
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. How many people do you see? How
9. What part of picture?
10. Have the picture remind you of any person you have seen, any place you have visited, any book read, or any movie seen?

GRADE IV - (Outdoor Passage)

ADVENTURES OF THE WOODLAWNS

PART II - Report On Outdoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of children's flight. Put an (x) where they finally came to rest.
3. Make a list of everything you see in your picture.
4. Do you see colors in your picture? If so, name them.
5. Do you see colors on objects or people? Name the colors and on what you see them.
6. Do you hear any sounds?
7. What time of year is it? What time of day? What is the temperature?
8. Do you smell anything?
9. Do you taste anything?
10. How many people? Ages
11. Does the picture remind you of any person you have seen, any place you have visited, any book read, or any movie seen?

GRADE IV - (Student Response)

ADVENTURES OF THE WOODLAND

PART IV - Report On Student Progress

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of children's friends. Put an (x) where they usually come to meet.
3. Take a list of everything you see in your picture.
4. Do you see colors in your picture? If so, name them.
5. Do you see colors on objects or people? Name the colors and on what you see them.
6. Do you hear any sounds?
7. What kind of year is it? What time of day? What is the temperature?
8. Do you smell anything?
9. Do you taste anything?
10. How many people? And
11. Tell the picture telling you of any person you have seen, any place you have visited, the book read, or any other scene.

GRADE V - (Indoor Passage)

THE SQUIRRELS TALE

Introductory Questions

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books either from your school library or public library? Yes No
Number of books read this year.....
3. What kind of stories do you like best?
4. Do you like books better with or without pictures?
5. Do you enjoy a play or story better to see it as a motion picture or to listen to it over the radio?
6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

.

Part I - Report On Indoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of one room or both rooms. Make a list of everything you see.
3. What colors do you see?
4. Do you see colors on objects or people? Name the colors and on what you see them.
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. What people do you see? Ages
9. Do you see any presents under or near the tree?
10. Does the child remind you of any child you have seen before, or any room you have seen?
11. Does the picture remind you of any book you have read, or any movie you have seen?

GRADE V - (Indoor Passage)

THE READING TEST

Indoor Passage

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books other than your school library or public library? Yes No
3. What kind of stories do you like best?
4. Do you like books better with or without pictures?
5. Do you enjoy a play or story better to see it on a screen picture or to listen to it over the radio?
6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

Part I - Report on Indoor Passage

1. Do you see a picture in your child's eye? Yes No
2. Sketch a diagram of one room or both rooms. Make a list of everything you see.
3. What colors do you see?
4. Do you see colors on objects or people? Name the colors and on what you see them.
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. What people do you see? Ages
9. Do you see any animals other than the dog?
10. Does the child remind you of any child you have seen before, or any race you have seen?
11. Does the picture remind you of any book you have read, or any story you have heard?

GRADE II - (Indoor Passage)

GRADE III - (Indoor Passage)

Introductory Questions

GRADE V - (Outdoor Passage)

HIS FIRST BEE TREE

PART II - Report On Outdoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Make a sketch showing direction Teddy fell and put an (x) where he landed.
3. Do you see colors in your picture? Name the colors and on what you see them.
4. Do you hear any sounds?
5. Do you smell anything?
6. Do you taste anything?
7. What is the time of year? Time of day? Temperature?
8. What is the clearest part of your picture?
9. Does the picture remind you of any book you have read, any place you have been, or any movie you have seen?

Page 5 - (Author's page)

THE FIRST PART

PART II - Report on Outdoor Research

1. Do you see a picture in your mind's eye? Yes No
2. Make a sketch showing direction (Toby's) and put an (x) where he landed.
3. Do you see colors in your picture? What the colors and on what you see them.
4. Do you hear any sounds?
5. Do you see anything?
6. Do you taste anything?
7. What is the time of day? Temperature?
8. What is the character of your picture?
9. Does the picture remind you of any book you have read, any place you have been, or any movie you have seen?

GRADE VI - (Indoor Passage)

YOUNGER BROTHER TRAVELS WEST

Introductory Questions

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books either from your school library or public library? Yes No
Number of books read this year
3. What kind of stories do you like best?
4. Do you like books better with or without pictures?
5. Do you enjoy a play or story better to see it as a motion picture or to listen to it over the radio?
6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

.....

Part I - Report On Indoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of the room, locating what you see in the room.
3. Do you see any colors in your picture? Name the colors and on what you see them.
4. Do you hear any sounds?
5. Do you smell or taste anything?
6. How many people do you see? Ages
7. How are they dressed?
8. What is the clearest part of the picture?
9. Does the picture in your mind's eye remind you of any place you have seen, any book read, any movie seen, or any people you have met before?

GRADE VI - (Indoor Passage)

YOU HAVE IN THE PAST READ SOME

Interlocking Questions

1. Do you like to read? Yes No
2. Do you enjoy reading enough to read books other than your school library or public library? Yes No
3. Number of books read this year
4. What kind of stories do you like best?
5. Do you like books better with or without pictures?
6. Do you enjoy a play or story better to see it on a screen picture or to listen to it over the radio?
7. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

.....

Part I - Stories on Indoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Sketch a diagram of the room, locating what you see in the room.
3. Do you see any colors in your mind's eye? Name the colors and as many as you can.
4. Do you hear any sounds?
5. Do you smell or taste anything?
6. Do many people do you meet? Ages
7. How are they dressed?
8. What is the atmosphere (mood) of the picture?
9. Does the picture in your mind's eye remind you of any place you have seen, any book read, any movie seen, or any people you have met before?

GRADE VI - (Outdoor Passage)

MEETING THE WILD WEST SHOW

Part II - Report On Outdoor Passage

1. Do you see a picture in your mind's eye? Yes No
2. Make a list of the things you see or sketch a diagram locating what you see.
3. Do you see any colors in your picture? Name the colors and on what you see them.
4. How many people do you see?
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. What is the time of year? What is the time of day? What is the temperature?
9. Is the picture still or moving?
10. Does the picture in your mind's eye remind you of any place you have been, any people you have seen, any book you have read, or any movie seen?

CHAPTER II - (Editor's Note)

THE NEW WORLD

Part I - (Editor's Note)

1. Do you see a picture in your mind's eye? Yes No
2. Make a list of the things you see or which you are looking at.
3. Do you see any colors? Name the colors and what you see.
4. How many words do you use?
5. Do you hear any sounds?
6. Do you smell anything?
7. Do you taste anything?
8. What is the time of year? What is the time of day? What is the temperature?
9. Is the picture still or moving?
10. Does the picture in your mind's eye remind you of any place you have been, any people you have seen, any book you have read, or any movie you have seen?

Method

In order to get experience and practice and discover the thought processes and mental imagery variances of different pupils, the writer gave 64 individual tests to pupils in all four sections previously mentioned. It took about an hour to give an individual test, which consisted of the silent reading of both the outdoor and indoor typewritten selections, the oral interrogation by the writer, and the writing of the oral responses by the writer. The presentation of one part of the test was made and the answers recorded before the presentation of the second part was made to the pupil.

In the case of the other 406 pupils, group tests were administered to small numbers of 10 to 15 pupils. In this latter case, the selection, written on the board, was read silently by the pupils, and the questions were then written on the board and read silently by the pupils. The writing of the responses by the pupils themselves was the reverse of the procedure for the individual testing.

The order of presentation of material to the pupil varied. To every other pupil in the individual testing, the indoor selection was submitted first. In the case of the group, the order was varied with each group tested.

In order to give experience and practice and discover the thought processes and mental imagery of different pupils, the writer gave individual tests to pupils in all four sections previously mentioned. It took about an hour to give an individual test, which consisted of a silent reading of half the text and a short question session, the oral interpretation by the writer, and the writing of the oral response by the writer. The presentation of one part of the text was made and the answers recorded before the presentation of the second part was made to the pupils.

In the case of the other 400 pupils, group tests were administered to small numbers of 10 to 15 pupils. In this latter case, the selection, written on the board, was read silently by the pupils, and the questions were then written on the board and read silently by the pupils. The writing of the responses by the pupils themselves was the reverse of the procedure for the individual testing.

The order of presentation of material to the pupils varied. To every 100 or 150 pupils in the individual testing, the order selection was emphasized first. In the case of the group, the order was varied with each group tested.

Before each individual or each group were given the test, an explanation was made concerning the pictures that come to one's mind while reading.

To each group or pupil the writer made the following explanation:

"Some people have more of a picture in their mind's eye than others do. Each person may have a different sort of picture. I want to know exactly what you see, if you see colors, if there are sounds, if there is an odor or taste, or if there is anything you feel in your picture, such as the temperature or wind. Do not be concerned with what Mary or John sees or hears. I want to know what you see, or hear, or taste, what comes in your picture. There is no right answer or no wrong answer. If you see nothing, say so; if you see much, tell all you see, hear, taste, smell, and so on."

Explanations were made concerning the same introductory questions asked of all 470 pupils.

Question 1. Do you like to read?

Explanation: "Do you really and truly enjoy reading? Is reading fun for you? I want you to tell me how you honestly feel about reading books. If you like to read, say yes. If you don't like it, say no."

Before each individual or each group was given the test,
an explanation was made concerning the pictures that were to be
and while reading.

To each group or pupil the writer made the following

explanation:

"Some people have more of a picture in their mind's eye
than others do. Each person may have a different sort of picture.
I want to know exactly what you see, if you see nothing, if there
are sounds, if there is an odor or taste, or if there is anything
you feel in your stomach, such as the temperature or wind. Do not
be concerned with what may or may not be there. I want to know
what you see, or hear, or taste, or feel, or smell in your picture.
There is no right answer or no wrong answer. If you see nothing,
say so; if you see something, tell all you see, hear, taste, smell,
and so on."

The pictures were made concerning the same introductory

questions asked of all 450 pupils.

Question 1. Do you like to read?

Explanation: "Do you really and truly enjoy reading?"

Is reading fun for you? I want you to tell me how you honestly
feel about reading books. If you like to read, say yes. If you
don't like it, say no.

Question 2. Do you read books from the library? Yes No
Number of books read this year

Explanation: "Do you enjoy reading enough to read library books, either from your school library or public library? How many books have you read this year? Tell me the number you have read."

Question 3. What kind of stories do you like the best?

Explanation: "Tell me your favorite kind of story, whether it is fairy or true, history, cowboys, adventure, animals, the very kind which you enjoy most."

Question 4. Do you like books better with pictures or without?

Explanation: "Tell me, when you read a book, if you prefer a book with no pictures, or one with pictures."

Question 5. Do you enjoy a play or story better as a motion picture or given over the radio?

Explanation: "Would you prefer to see a play or a story at the movies, or would you rather hear that same story on the radio?"

Question 6. Which do you enjoy better, reading a book yourself or having someone read the same book to you?

Explanation: "Do you enjoy and get more fun from having someone read a story to you, or do you prefer to read that same story yourself? Which gives you more pleasure?"

Question 1. Do you read books from the library? Yes No
Number of books read this year.....

Explanation: "Do you enjoy reading enough to read library
books, either from your school library or public library? How many
books have you read this year? Tell me the number you have read."

Question 2. What kind of stories do you like the best?

Explanation: "Tell me your favorite kind of story."

Whether it is fairy or true, history, detective, adventure, science,
the very kind which you enjoy most."

Question 3. Do you like books better with pictures or

without?

Explanation: "Tell me, when you read a book, do you

prefer a book with no pictures, or one with pictures?"

Question 4. Do you enjoy a play or story better as a

written picture or given over the radio?

Explanation: "Would you prefer to read a play or a story

of the movies, or would you rather hear the same story on the

radio?"

Question 5. Which do you enjoy better, reading a book

yourself or having someone read the same book to you?

Explanation: "Do you enjoy and like more the first having

someone read a story to you, or do you prefer to read that same

story yourself? Which gives you more pleasure?"

These introductory questions were the same for the group test as for the individual test. The writer asked the questions orally in the case of the individual test, and the oral responses in each case were recorded by the writer. In the group test, the children read silently, oral explanations were made by the writer, and the children wrote their own answers in as few words as possible.

The steps to the tests for each grade were completed in the following order:

1. Silent reading of the selection.
2. Selection removed from view.

In the individual test, the typewritten selection was removed by the writer.

In the group test, the selection written in script on the board, was erased by the writer.

3. Reporting and recording answers to questions.

In the individual test, the answers, given orally by the pupil, were recorded and written by the writer.

In the group test, the answers were written by the pupils.

The difference between the individual test and the group test has been previously described.

These laboratory questions were the same for the group test as for the individual test. The writer asked the questions orally in the case of the individual test, and the oral responses in each case were recorded by the writer. In the group test, the children read silently, oral explanations were made by the writer, and the children wrote their own answers as far words as possible.

The groups of four and six each were completed

in the following order:

1. Silent reading of the selection.

2. Questions received from writer.

In the individual test, the questions

asked for were recorded by the writer.

In the group test, the questions asked

in writing to the writer, were asked by the

writer.

3. Reporting and recording answers to questions.

In the individual test, the answers, given

orally by the writer, were recorded and

written by the writer.

In the group test, the answers were written

by the writer.

The difference between the individual test and the

group test has been previously described.

Scoring The Tests For Mental Imagery

The next problem was to devise some means of scoring and recording the mental imagery of the 470 pupils tested.

First a sampling of 100 papers, taken at random, was examined and they were classified into five groups of mental imagery; high, good, average, below average, and poor. The writer then observed, under each classification, comparisons in visual imagery, noting not only presence or absence of colors, but also whether the colors were simply named or definitely associated with a person, his clothing, objects, or scenery. Auditory, olfactory, and gustatory imagery was carefully recorded. The presence of any other imagery, such as motor, kinesthetic, or tactile was noted and considered in one miscellaneous group.

Previous investigations had proven individual differences, previous surveys had stressed predominance of one kind of imagery over another.

The writer, in general, found a great predominance of visual imagery over other types of imagery. By types, the writer means kinds of imagery. She refers to the interpretation of types by Fernald^{1/}. Every object, every color was observed, but each color and each object was counted only once, even though it was

^{1/} Mabel Ruth Fernald, op. cit., p. 130.

The first step in the study of the

and the second step is the study of the

third step is the study of the

fourth step is the study of the

fifth step is the study of the

sixth step is the study of the

seventh step is the study of the

eighth step is the study of the

ninth step is the study of the

tenth step is the study of the

eleventh step is the study of the

twelfth step is the study of the

thirteenth step is the study of the

fourteenth step is the study of the

fifteenth step is the study of the

sixteenth step is the study of the

seventeenth step is the study of the

eighteenth step is the study of the

nineteenth step is the study of the

twentieth step is the study of the

mentioned under both visual (things, persons seen) and under colors. After elimination of repeated enumerations, and after many comparisons of the test papers, the following scale was adopted for measuring the mental imagery in silent reading of all the 470 pupils of this study.

It is to be noted, in this particular testing, the scale ran from 0 - 74. Tests using different selections might have a very different range.

FABRONS FALCONBOND FABRIC

continued under this name (Falconbond) and under
 colors. After a number of successful experiments, and after
 many comparisons of the two fabrics, the following results were
 obtained for measuring the weight of the fabric in different weights of
 all the 477 pairs of this study.

It is to be noted, in this particular testing, the
 results for the 477 pairs of 7. The following different colors were
 have a very slight change.

TABLE II - SCALE FOR MEASURING MENTAL IMAGERY IN SILENT READING
OF THE 470 PUPILS INCLUDED IN THIS SURVEY

	Very Poor	Below Average	Average	Good	High
	0 - <u>14</u>	15 - <u>29</u>	30 - <u>44</u>	45 - <u>59</u>	60 - <u>74</u>
Visual	0 - 6	14	21	30	36
Colors	0 - 4	7	10	12	14
Auditory	0 - 2	3	4	5	8
Olfactory Gustatory	0 - 1	2	4	5	8
Miscellaneous	0 - 1	3	5	7	8
Total	<u>14</u>	<u>29</u>	<u>44</u>	<u>59</u>	<u>74</u>

On pages 52 and 53 are examples of two tests scored and marked according to the imagery scale adopted. It was a simple matter to score the papers low in imagery, but the papers with high imagery required considerable time and careful examination.

The writer, for the purpose of clarifying the method of scoring for the reader, has, in the case of the test paper, high in imagery, selected and recorded the exact phrases used by the pupil for expressing his visual, auditory, olfactory, gustatory, and miscellaneous imagery.

On pages 32 and 33 are examples of two cases treated and
 referred to in the text. It was a simple
 matter to locate the page in the paper, but the paper was
 high in quality and suitable for the purpose of
 the writer. The purpose of this paper is to
 be useful for the reader, and it is the hope of the writer
 that it will be useful and recorded in the same manner as
 the paper for expressing his views, and that it will be
 and a valuable paper.

Pupil No. 12

Indoor=0
Outdoor=6
Total 6

Indoor - Grade VI	Outdoor - Grade VI
Younger Brother Travels West	Meeting The Wild West Show
Can't see any picture 0	<ol style="list-style-type: none"> 1. Yes, faintly 2. Animals, clowns, tents, ballons 4 3. Gray picture, no colors 4. No people 5. No sounds 6. No odors 7. Nothing do I taste 8. Spring 2 P.M. 90° 1 9. Don't know 10. Reminds me of a circus I saw 1

Pupil No. 29

Indoor - Grade V		Outdoor - Grade V	
The Squirrels Tale		His First Bee Tree	
Visual	Child asleep. mother, father, nurse, table, star, squirrels, radio, bookcase, lamp, 2 windows, door, presents	Indoor=38 Outdoor=26 Total 64	Canyon Trees Teddy bear Birds Rocks Saw Teddy fall 20 feet
Colors	Blue on bedspread Blue on bed Blue on bureau Green tree Shining balls of silver, red, green, yellow, violet, orange Brown divan Brown chairs Red fireplace White popcorn	7 colors on 9 visual	Breen bushes Blue sky Brown trunk of trees Green grass Blue berries Brown bear Yellow flowers
Sounds	Boy breathing Clock ticking Radio	3	Hear Teddy Bear's feet as he walks Bushes crackling as he fell Thump when he landed Wind sighing
Odors	Popcorn Xmas tree	2	Honey, trees, flowers
Taste	0		Blue berries
Misc.	Christmas, winter, 7 P.M. Reminds me of my cousin's house, and my cousin is like the naughty child.	1	Summer afternoon 1 o'clock, temperature hot 80° Reminds me of two different stories I have read, but I can't remember their names.

	Indoor		Outdoor		Totals
Visual	13	+ 9 =22	5	+ 7 =12	34
Colors		9		4	13
Auditory		3		4	7
Olfactory		2		4	6
Gustatory					
Misc.		2		2	4
Totals		38		26	64

CHAPTER IV

DESCRIPTION AND ANALYSIS OF DATA

This chapter will present a description

CHAPTER IV

and analysis of the data obtained during this study

of which

DESCRIPTION AND ANALYSIS OF DATA

RECEIVED
FEBRUARY 1945

CHAPTER IV

DESCRIPTION AND ANALYSIS OF DATA

CHAPTER IV

DESCRIPTION AND ANALYSIS OF DATA

This chapter will present a description and analysis of the data obtained during this study of mental imagery in children's silent reading.

CHAPTER IV

DESCRIPTION AND ANALYSIS OF DATA

This chapter will present a description and analysis of the data obtained during this study of mental therapy in children's clinical practice.

TABLE III - COMBINED SCORES IN MENTAL IMAGERY OF 470 PUPILS
IN GRADES IV, V AND VI

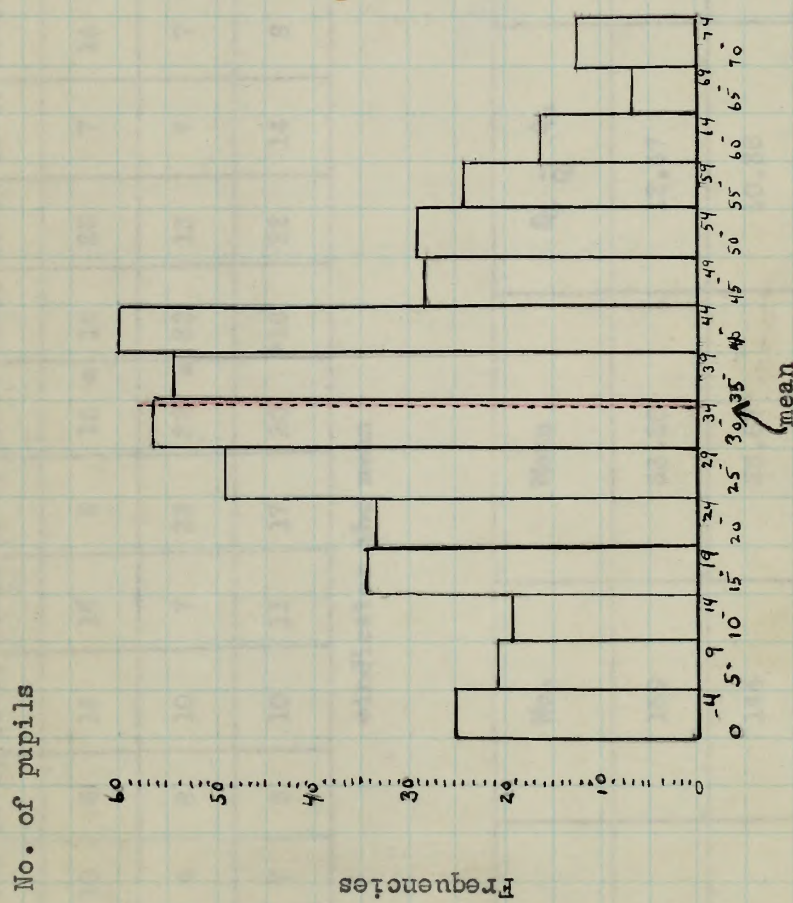
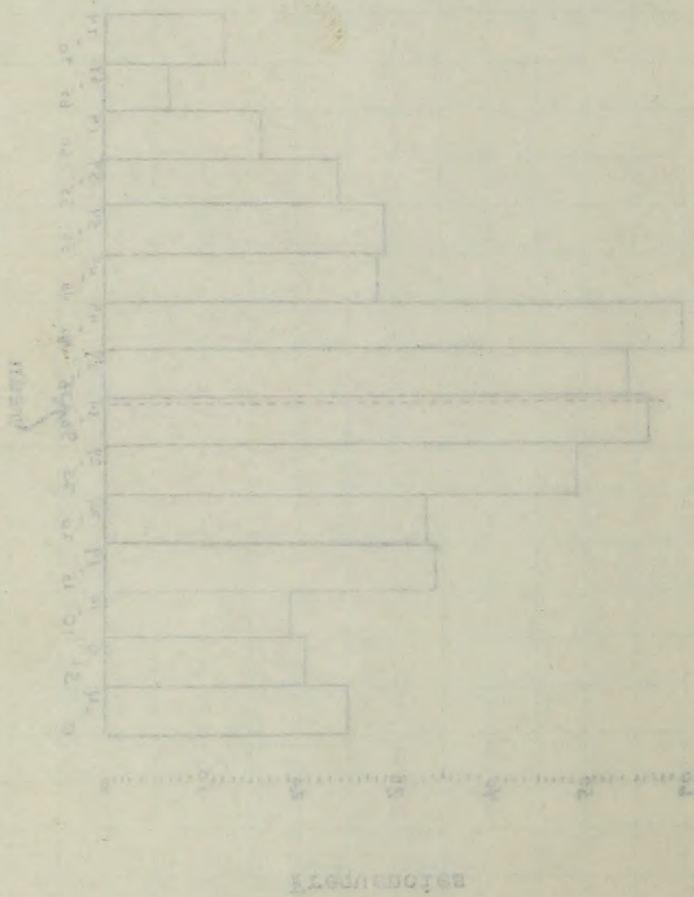


Table III shows the combined scores in mental imagery made by the 470 pupils in Grades IV, V and VI. Forty-seven percent (47%) of the scores are concentrated in the 4 intervals, 25-29; 30-34; 35-39 and 40-44. The mean score of the 470 pupils is 34.6

mean value of the 410 babies is 34.0

and is compared in the 4. The mean of the 410 babies is 34.0 and the mean of the 410 babies is 34.0

Table III shows the combined mean in the 410 babies is 34.0



No. of babies

TABLE III - COMBINED MEAN IN THE 410 BABIES

TABLE IV - INDIVIDUAL DIFFERENCES IN MENTAL IMAGERY SCORES BY GRADE LEVELS

Grade	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
IV	159	10	10	6	14	15	9	15	16	25	7	14	8	4	2	4
V	144	5	4	8	10	7	23	22	22	13	7	7	4	7	2	3
VI	167	10	7	5	10	11	17	20	16	22	14	8	12	6	3	6

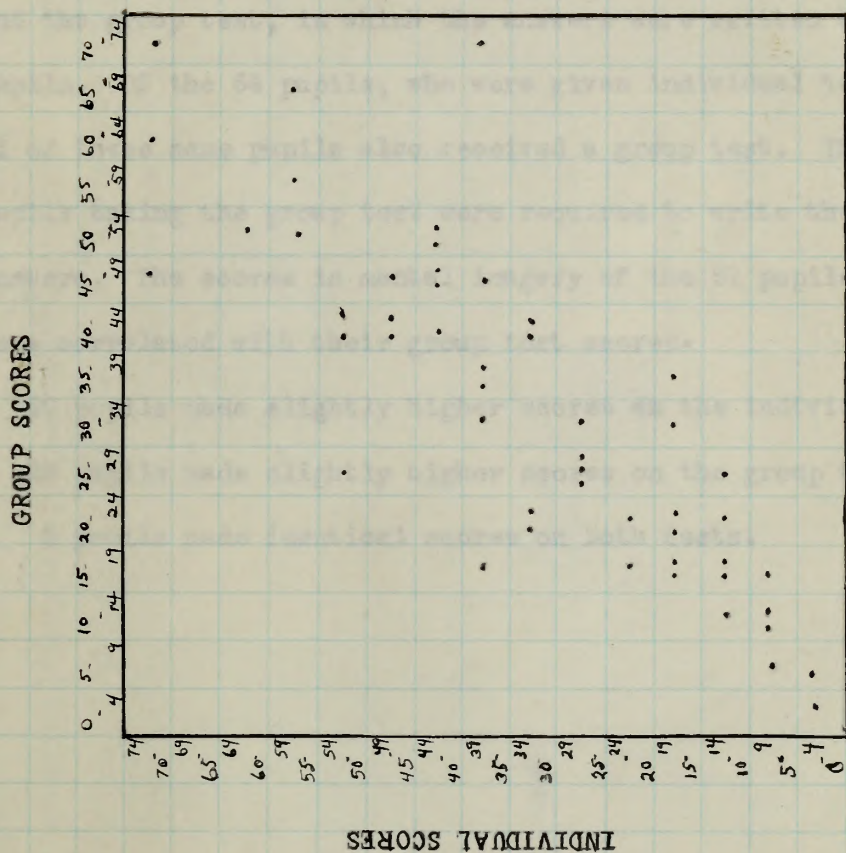
• indicates the mean

Grade	No.	Mean	$Q_3 - Q_1$	Range
IV	159	33.20	12.47	0 - 74
V	144	33.67	10.36	0 - 74
VI	167	35.45	9.08	0 - 74

The data in Table IV show the individual differences in mental imagery by grade levels. The frequencies of the scores are given. The mean score is almost identical for grades IV and V. In grade VI the slightly higher score is too little to indicate any significant difference in mental imagery in the grades tested.

The data in Table IV show the individual differences in mental capacity by grade levels. The frequencies of the scores are given. The mean score is shown (horizontal) for grades IV and V. In grade VI the slightly higher score is too little to indicate any significant difference in mental capacity in the grades tested.

TABLE V - SCORES IN MENTAL IMAGERY INDIVIDUAL REPORTS (ORAL)
VERSUS GROUP TEST (WRITTEN)

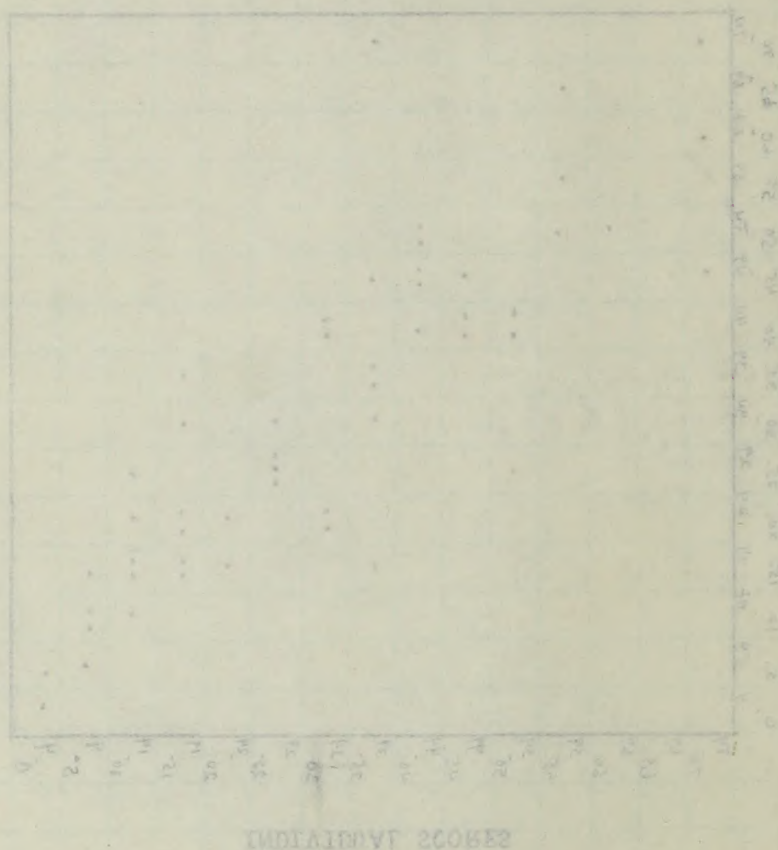


Number of pupils = 51

$r = .84$

TABLE 1. - AVERAGE SCORES IN NATURAL DROPPED AND CONTROLLED (QNT)

GROUP 1



12. - 5 F

12. - 5 F to 100000

Table V shows a correlation of .84 between the individual tests, in which the reports were given orally, and the group test, in which the answers were written by the pupils. Of the 64 pupils, who were given individual tests, 51 of these same pupils also received a group test. The pupils taking the group test were required to write their answers. The scores in mental imagery of the 51 pupils were correlated with their group test scores.

19 pupils made slightly higher scores on the individual test.

29 pupils made slightly higher scores on the group test.

3 pupils made identical scores on both tests.

Table 7 shows a correlation of .86 between the individual tests, in which the reports were given orally, and the group test, in which the answers were written by the pupils. Of the 61 pupils who were given individual tests, 51 of these pupils also received a group test. The pupils taking the group test were required to write their answers. The scores in verbal language of the 51 pupils are correlated with their group test scores.

15 pupils made slightly higher scores on the individual test.

32 pupils made slightly higher scores on the group test.

3 pupils made identical scores on both tests.

TABLE VI - SEX DIFFERENCES IN MENTAL IMAGERY SCORES BY GRADE LEVELS

No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
							<u>GRADE IV</u>								
Boys 87	8	6	3	9	6	6	10	11	7	4	6	6	2	1	2
Girls 72	2	4	3	6	9	3	5	5	18	3	7	2	2	1	2
							<u>GRADE V</u>								
Boys 68	5	4	6	7	4	11	11	8	4	4	0	1	1	1	1
Girls 76	0	0	2	3	3	12	12	14	9	3	7	3	6	0	2
							<u>GRADE VI</u>								
Boys 77	8	4	4	4	4	10	13	8	8	7	1	4	0	0	2
Girls 90	2	4	2	5	7	7	5	8	13	9	7	8	6	3	4

• indicates the mean

TABLE VI - SEX DIFFERENCES IN MENTAL IMAGERY SCORES BY GRADE LEVELS
(Cont.)

	No.	Mean	S.E. _M	Diff.	S.E. Diff.	Critical Ratio
				<u>GRADE IV</u>		
Boys	87	31.50	± 1.96	3.30	± 2.78	1.19
Girls	72	34.80	± 1.97	-----	-----	-----
				<u>GRADE V</u>		
Boys	68	27.60	± 1.87	11.05	± 2.43	4.54
Girls	76	38.64	± 1.55	-----	-----	-----
				<u>GRADE VI</u>		
Boys	77	30.09	± 1.89	9.80	± 2.66	3.68
Girls	90	39.89	± 1.88	-----	-----	-----

TABLE 1 - DATA FOR THE CALCULATION OF THE CHARGE FACTOR

TEST NO.	DATE	TIME	TEMP.	WIND	WIND DIR.	WIND SPEED
101	10/1/54	10:00	58.1	10	10	10
102	10/1/54	10:00	58.1	10	10	10
103	10/1/54	10:00	58.1	10	10	10
104	10/1/54	10:00	58.1	10	10	10
105	10/1/54	10:00	58.1	10	10	10
106	10/1/54	10:00	58.1	10	10	10
107	10/1/54	10:00	58.1	10	10	10
108	10/1/54	10:00	58.1	10	10	10
109	10/1/54	10:00	58.1	10	10	10
110	10/1/54	10:00	58.1	10	10	10
111	10/1/54	10:00	58.1	10	10	10
112	10/1/54	10:00	58.1	10	10	10
113	10/1/54	10:00	58.1	10	10	10
114	10/1/54	10:00	58.1	10	10	10
115	10/1/54	10:00	58.1	10	10	10
116	10/1/54	10:00	58.1	10	10	10
117	10/1/54	10:00	58.1	10	10	10
118	10/1/54	10:00	58.1	10	10	10
119	10/1/54	10:00	58.1	10	10	10
120	10/1/54	10:00	58.1	10	10	10

The data in Table VI, show that in mental imagery the girls made higher scores than the boys in each grade. Since the boys and the girls were not paired for mental age, the validity of the scores may be questioned. Nevertheless, here are these differences. The mean score for the girls in grade IV, 34.80, was 3.30 higher than the mean score of the boys 31.50. The critical ratio of 1.19 is fairly significant, since it shows that there are 88 chances in a 100 that the girls of grade IV will be superior to the boys in grade IV in mental imagery.

The difference between the mean scores of the boys and girls in grade V was 11.05, in favor of the girls. The critical ratio of 4.54 is very significant and indicative of a virtual certainty that the girls in grade V will always score higher in mental imagery than the boys.

In grade VI the difference between the means was 9.80 in favor of the girls. The critical ratio of 3.68 is again very significant since it indicates a virtual certainty that the girls in grade VI will always score higher in mental imagery than the boys.

It is interesting to observe that the mean score in imagery for the boys in grade VI is slightly lower by a difference of 1.41 than in grade IV, although the difference is too small to be at all significant. It indicates practically an unchanged score in imagery in grades IV, V, and VI for the boys. Chronological age

The data in Table VI, show that in general, the girls made slightly better than the boys in each grade, since the boys and the girls were not paired for mental age, the validity of the scores may be questioned. Nevertheless, there are these differences. The mean score for the girls in grade IV, 34.30, was 2.30 higher than the mean score of the boys 32.00. The critical ratio of 1.1 is fairly significant, since it shows that there are 23 chances in 100 that the girls of grade IV will be superior to the boys in grade IV in mental language.

The difference between the mean scores of the boys and girls in grade V was 11.00, in favor of the girls. The critical ratio of 1.55 is very significant and indicative of a virtual certainty that the girls in grade V will always score higher in mental language than the boys.

In grade VI the difference between the mean was 9.30 in favor of the girls. The critical ratio of 2.68 is again very significant since it indicates a virtual certainty that the girls in grade VI will always score higher in mental language than the boys.

It is interesting to observe that the mean score in language for the boys in grade VI is slightly lower by a difference of 1.41 than in grade IV, although the difference is too small to be at all significant. It indicates practically an unchanged score in language in grades IV, V, and VI for the boys. Chronological age

evidently makes no difference in increasing the amount of imagery for boys. However, the difference in the mean score for the girls in grade VI is 5.09 above the score in grade IV. This may or may not be significant. It evidently accounts for the slightly higher score made by the pupils of grade VI in the data shown in Table IV. As has been indicated, the boys and girls were not paired for mental ages, hence too much reliability cannot be placed on these differences.

TABLE VII - MENTAL IMAGERY SCORES OF 470 PUPILS ON THE INDOOR SELECTION VERSUS THE OUTDOOR SELECTION

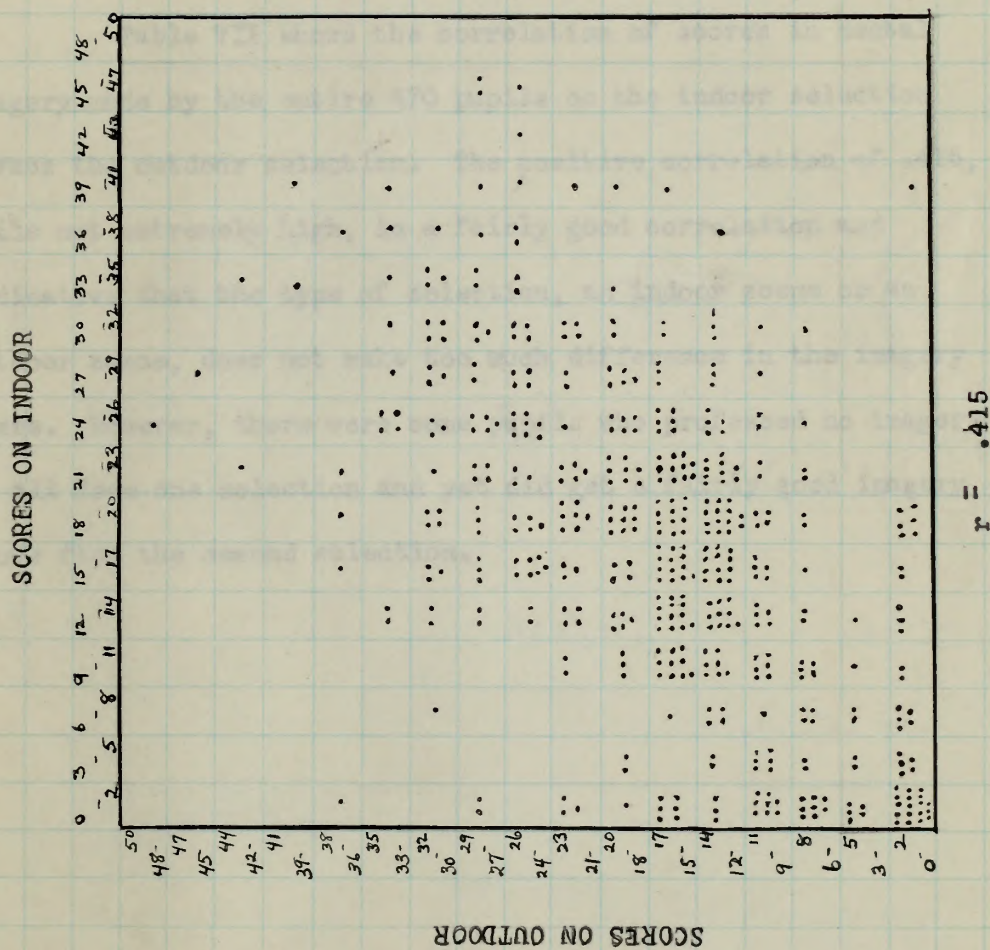
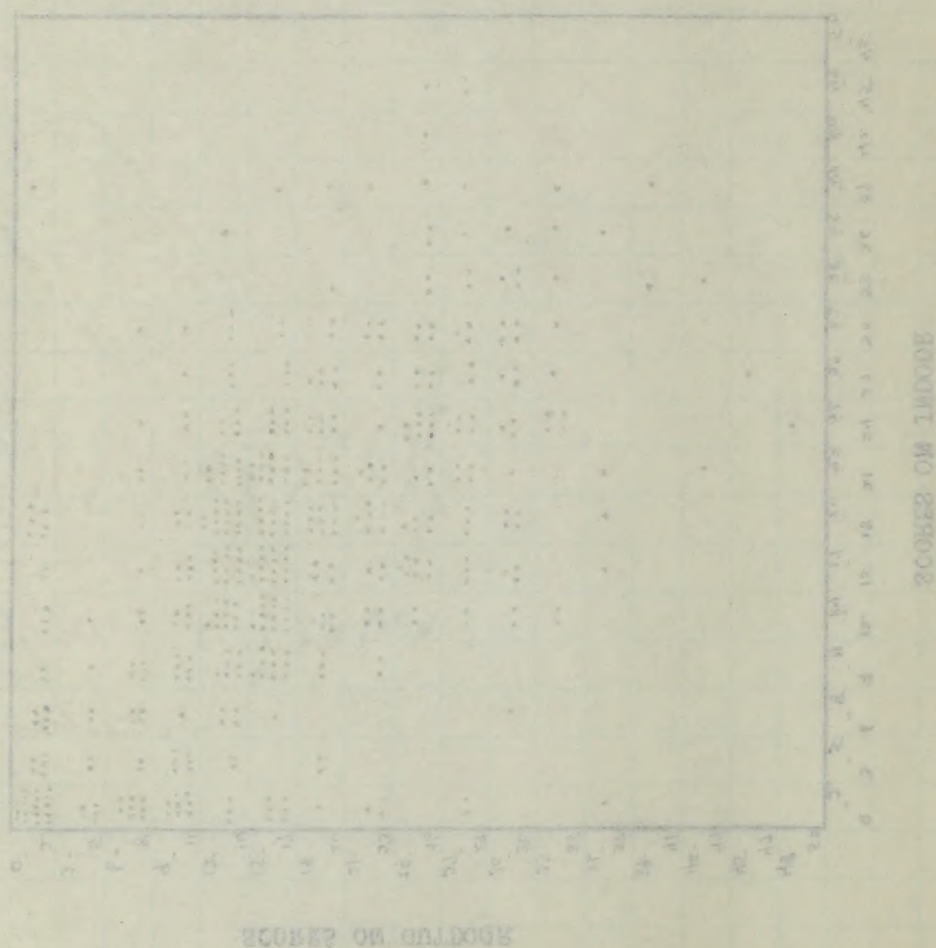


FIG. 2

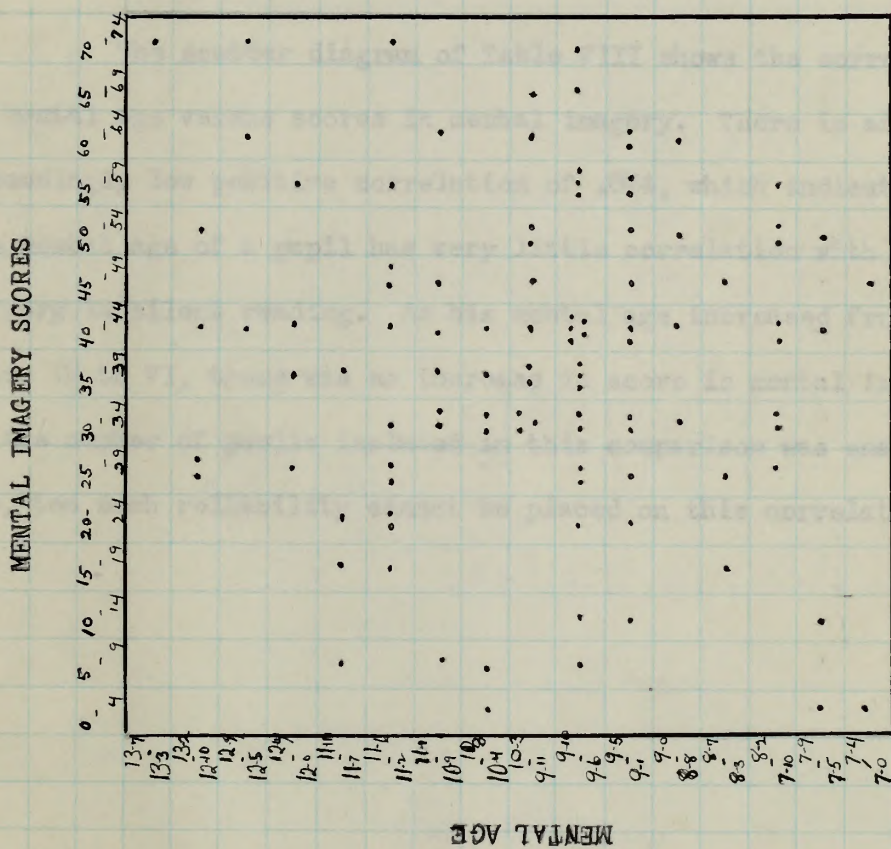


INDOOR SATISFACTION AMONGST THE ORIGIN OF DETECTION
 THERE ARE NO SIGNIFICANT DIFFERENCES IN THE
 MOTIVATION OF THE TWO GROUPS OF THE INDOOR AND THE
 OUTDOOR GROUPS.

Table VII shows the correlation of scores in mental imagery made by the entire 470 pupils on the indoor selection versus the outdoor selection. The positive correlation of .415, while not extremely high, is a fairly good correlation and indicative that the type of selection, an indoor scene or an outdoor scene, does not make too much difference in the imagery score. However, there were some pupils who professed no imagery at all from one selection and yet did get a fairly good imagery score from the second selection.

Table VII shows the correlation of scores in mental imagery made by the entire 470 pupils in the factor selection versus the outdoor selection. The positive correlation of .417, while not extremely high, is a fairly good correlation and indicates that the type of selection, an indoor score or an outdoor score, does not make too much difference in the imagery score. However, there were some pupils who professed no imagery at all from one selection and yet did get a fairly good imagery score from the second selection.

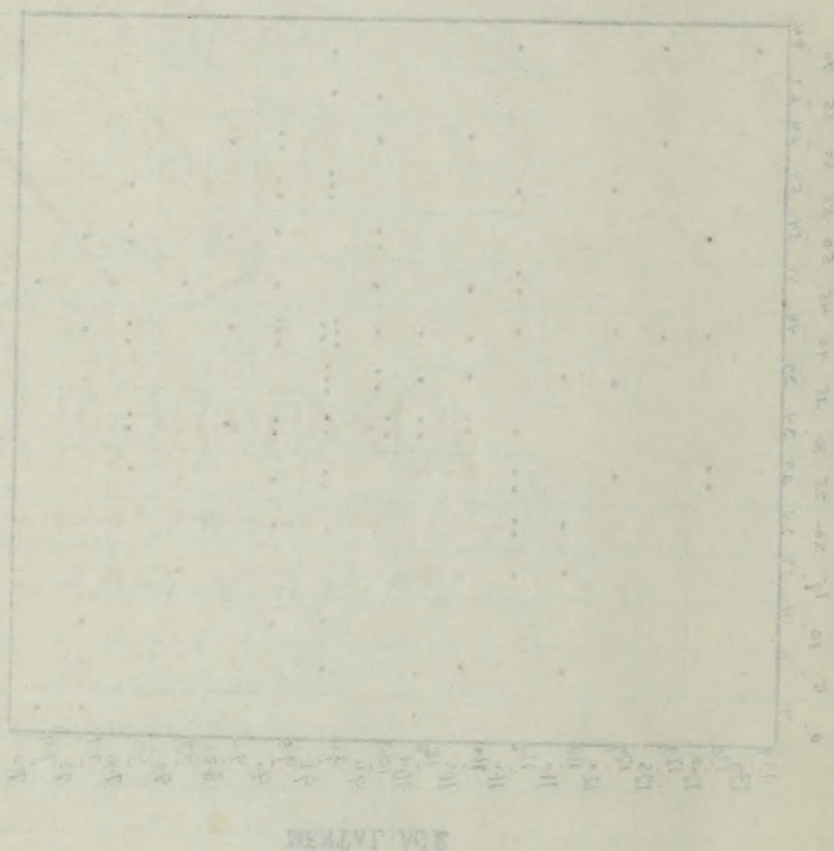
TABLE VIII - 105 CASES OF MENTAL AGE VERSUS MENTAL IMAGERY



No. of Pupils = 105 $r = .074$

APR. 1954

NO. OF OBSERVATIONS



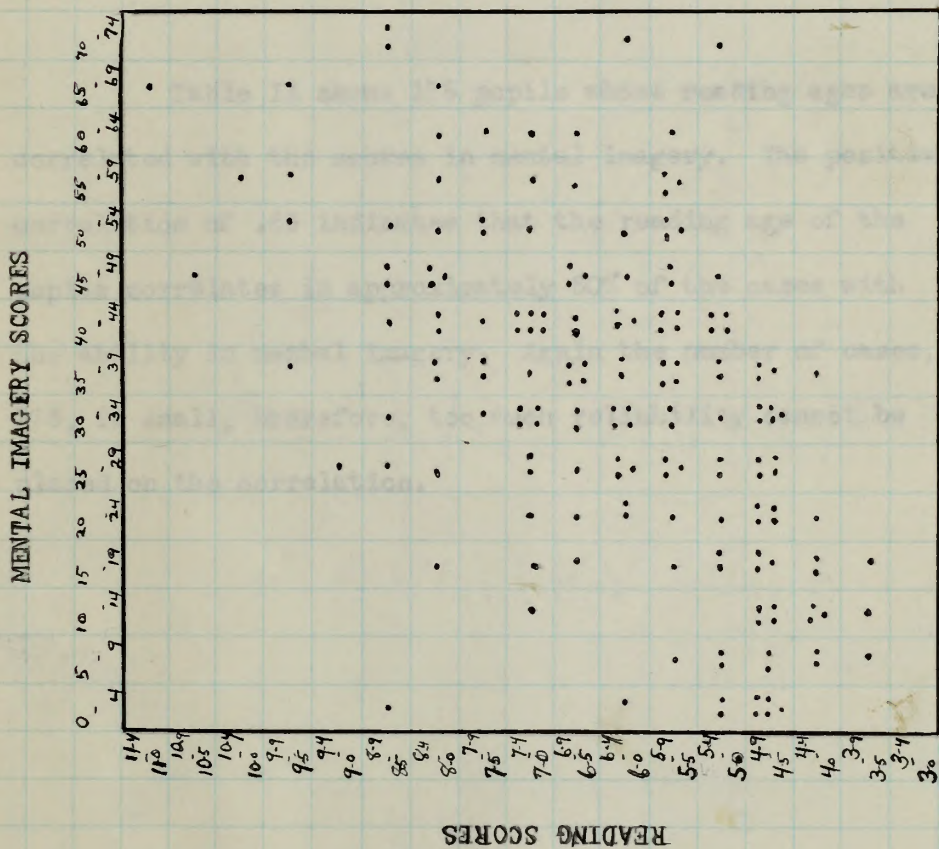
MEANLY LATITUDE

The scatter diagram of Table VIII shows the correlation of mental age versus scores in mental imagery. There is an exceedingly low positive correlation of $.074$, which indicates the mental age of a pupil has very little correlation with his imagery in silent reading. As his mental age increased from grade IV to VI, there was no increase in score in mental imagery. As the number of pupils included in this comparison was small, 105, too much reliability cannot be placed on this correlation.

The scatter diagram of Table VII shows the correlation

of mental age versus scores in mental history. There is an exceedingly low positive correlation of .04, which indicates the mental age of a pupil has very little correlation with his history in silent reading. In his mental age increased from grade IV to VI, there was no increase in score in mental history. As the number of pupils included in this comparison was small, too much reliability cannot be placed on this correlation.

TABLE IX - 175 CASES OF READING AGE VERSUS MENTAL IMAGERY



No. of Pupils = 175

$r = .53$

22
11
4

Table IX shows 175 pupils whose reading ages are correlated with the scores in mental imagery. The positive correlation of .53 indicates that the reading age of the pupils correlates in approximately 50% of the cases with the ability in mental imagery. Again the number of cases, 175, is small, therefore, too much reliability cannot be placed on the correlation.

Table II shows the results of the correlation analysis. The positive correlation with the degree of reading age of the mother is 0.55, indicating that the reading age of the mother is significantly correlated with the reading age of the child. The correlation with the degree of reading age of the father is 0.45, indicating that the reading age of the father is significantly correlated with the reading age of the child. The correlation with the degree of reading age of the mother and father is 0.35, indicating that the reading age of the mother and father is significantly correlated with the reading age of the child. The correlation with the degree of reading age of the mother and father is 0.25, indicating that the reading age of the mother and father is significantly correlated with the reading age of the child. The correlation with the degree of reading age of the mother and father is 0.15, indicating that the reading age of the mother and father is significantly correlated with the reading age of the child. The correlation with the degree of reading age of the mother and father is 0.05, indicating that the reading age of the mother and father is significantly correlated with the reading age of the child.

TABLE X - READING GROUPING (A, B, AND C) VERSUS MENTAL IMAGERY

Reading Groups	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
A	179	0	2	3	4	4	22	19	23	23	18	21	11	11	5	13
B	165	5	6	5	15	18	12	25	26	27	7	7	8	3	1	0
C	126	18	14	10	16	11	15	12	5	10	5	1	5	3	1	0

● indicates the mean

Reading Groups	No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
A	179	43.3	± 1.13	10.7	± 1.57	6.82
B	165	32.6	± 1.09	-----	-----	-----
B	165	32.6	± 1.09	8.9	± 1.85	4.81
C	126	23.7	± 1.5	-----	-----	-----

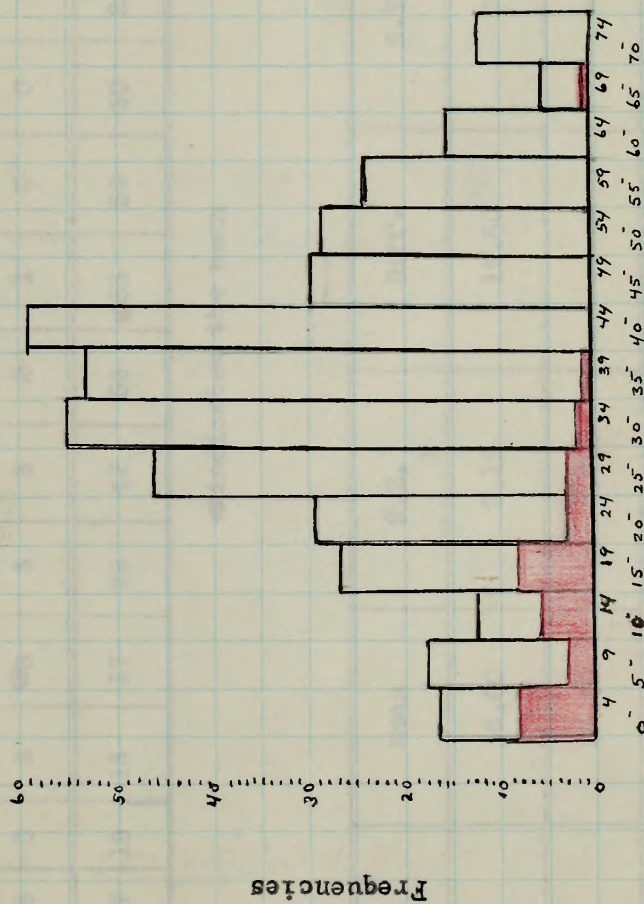
The data in Table X show the frequencies of the scores in mental imagery made by the 470 pupils, classified in three reading groups, according to ability. The mean score for the highest ability group in reading (A) is 43.3; the mean score for the middle group (B) is 32.6; and the mean score for the lowest group (C) is 23.70. The difference in the mean score between group A and B is 10.7, and the difference in mean score between group B and C is 8.9. The critical ratios of 6.82 and 4.81, respectively, are very significant.

The children were not paired for mental ages in these reading groups, hence too much reliability cannot be placed in the scores and differences.

Nevertheless, the differences are interesting, inasmuch as three reading groups are the usual grouping in the average classroom. The previous table, IX, with a small number of 105 cases, showed a positive correlation of .53 between reading age and mental imagery.

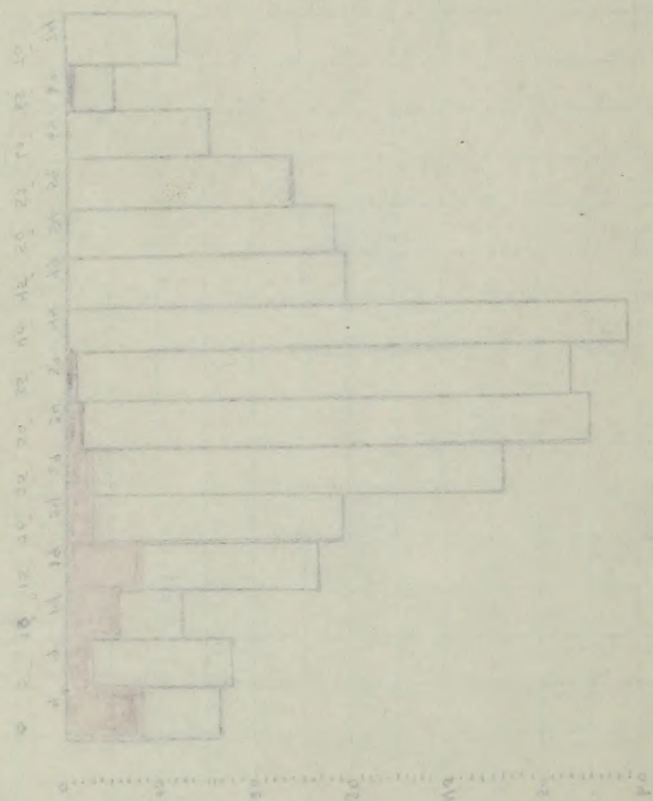
TABLE XI - LIKING TO READ VERSUS MENTAL IMAGERY

No. of pupils



= Scores of pupils who like to read Mean = 35.50
 = Scores of pupils who do not like to read Mean = 16.00

100 = 100%
 100 = 100%



No. of Individuals

TABLE XI - TIME TO REACH STATIONARY STATE

TABLE XII - LIKING TO READ VERSUS MENTAL IMAGERY

	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
NO	35	8	3	6	8	3	3	2	1	0	0	0	0	0	1	0
YES	435	17	18	13	27	29	47	55	53	59	30	28	24	16	6	13

● indicates the mean

	No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
NO	35	16.00	2.19	19.50	2.33	8.37
YES	435	35.50	.795	-----	-----	-----

Table XI is very significant. It shows the scores in mental imagery of the 35 pupils who did not like to read contrasted with scores in mental imagery of the 435 who did like to read.

Table XII shows the mean score in mental imagery for the 35 who didn't like to read to be 16.00. This is a decided contrast with the mean score in imagery of 35.5 of the 435 who did like to read. The difference between the means, 19.50, is large. The critical ratio of 8.37 is very significant and indicates a virtual certainty that those who enjoy reading and like to read will always score higher in mental imagery than those who do not.

Table II is very significant. It shows the scores in

mental imagery of the 30 subjects who did not like to read
contrasted with scores in mental imagery of the 30 who did like
to read.

Table III shows the mean score in mental imagery for

the 30 who didn't like to read to be 18.70. This is a decided
contrast with the mean score in imagery of 23.8 of the 30 who
did like to read. The difference between the means, 15.10,

is large. The critical ratio of 3.77 is very significant
and indicates a virtual certainty that those who enjoy reading
and like to read will always score higher in mental imagery
than those who do not.

TABLE XIII - AMOUNT OF FREE READING VERSUS MENTAL IMAGERY

Amount	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
Little 0-4 books	193	22	20	16	24	22	22	23	13	16	5	0	3	3	2	2
Average 5-9 books	148	3	1	3	9	8	22	20	31	25	8	6	7	3	1	1
Much - 10 and above	129	0	1	0	2	3	5	12	10	19	15	23	14	11	4	10

● indicates the mean

Amount	No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
Little 0-4 books	193	24.0	± 1.14	11.3	± 1.54	7.34
Average 5-9 books	148	35.3	± 1.04	-----	-----	-----
Average 5-9 books	148	35.3	± 1.04	12.5	± 1.22	10.2
Much - 10 and above	129	47.8	± 1.19	-----	-----	-----

2-8 POCPS 14-18	150	45.8	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3

Continuation of the above

2-8 POCPS 14-18	150	45.8	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3
2-8 POCPS 14-18	148	40.2	7.78	13.8	7.18	10.3	10.3

14714 XIII - 1701.1 06.12.1950

The data in Table XIII show the frequencies of the scores in mental imagery made by the 470 pupils versus the amount of free library reading. The number of pupils who read less than 5 books was 193, whereas 129 pupils had read 10 and more books. The mean score of those who did little library reading, less than 5 books, is 24.0. The mean score of those who read an average number of books, 5 to 9, is 35.30. The mean score of those who read more than 10 books is 47.8. The difference between the mean score of those who read few books and those who read an average number is 11.3. The critical ratio, 7.34, is significant. The difference between the mean score of those who read an average number of books and those who read much is 12.5. The critical ratio of 10.2 is very significant.

The data in Table VII show the reaction of the
 system in cases where the data were made by the 4th and 5th series of
 experiments of the library reading. The number of people who
 read the 5th series was 100, whereas 100 people had read
 10 and more books. The mean score of those who had read
 10 and more books, less than 5 books, is 10.0. The mean
 score of those who read an average number of books, 5 to 9,
 is 10.1. The mean score of those who read more than 10
 books is 10.5. The difference between the mean scores of those
 who read the 5th series and those who read an average number of 5 to 9,
 is 0.4, which is significant. The difference
 between the mean scores of those who read an average number of
 books and those who read more than 10 books is 0.4. The original mean
 of 10.0 is very significant.

TABLE XIV - SCORES IN MENTAL IMAGERY BY PUPILS WHO PREFERRED MOVIES
VERSUS SCORES BY PUPILS WHO PREFERRED THE RADIO

	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
Movies	369	22	15	17	30	26	41	44●	41	43	25	18	16	14	5	12
Radio	101	3	7	2	5	6	8	12	12●	17	5	10	9	3	1	1

● indicates the mean

	No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
Movies	369	33.5	± .906	2.6	± 1.85	1.41
Radio	101	36.1	± 1.61	-----	-----	-----

Table XIV indicates the frequencies of the scores made by those pupils who preferred movies in contrast with those who preferred the radio. Seventy-nine percent of the 470 pupils, i.e., 369, preferred movies to radio. There is little difference between the mean scores. The mean score of those who preferred the radio, 36.1, is 2.6 higher than the mean score of those who liked the movies. The critical ratio of 1.41 is significant, and indicates that there are 92 chances in a 100 that those who prefer the radio will score slightly higher than those who prefer the movies.

Table XIV indicates the frequencies of the scores

made by those people who preferred radio in contrast with those who preferred the radio. Twenty-nine percent of the 470 people, i.e., 136, preferred radio to radio. The mean difference between the mean scores. The mean score of those who preferred the radio, 57.1, is 2.6 higher than the mean score of those who liked the radio. The critical ratio of 1.41 is significant, and indicates that there are 92 chances in a 100 that those who prefer the radio will score slightly higher than those who prefer the radio.

TABLE XV - SCORES IN MENTAL IMAGERY BY PUPILS WHO PREFERRED TO READ
THEIR OWN STORIES VERSUS PUPILS WHO PREFERRED TO HEAR STORIES READ

No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
Reading	13	13	10	21	25	29	37	45	46	25	27	21	14	6	13
Hearing	12	9	8	14	8	19	19	10	13	5	2	3	3	0	0

● indicates the mean

No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
Reading	39.2	± .888	10.20	± 1.62	7.79
Hearing	26.6	± 1.35	-----	-----	-----

The data in Table XV show the frequencies of the scores of those who preferred to read their own stories as opposed to those who preferred to hear stories read. Seventy-four percent of the pupils, i.e., 345, prefer to read their own stories. The mean score of those who prefer to read their own stories is 39.2, and the mean score of those who prefer to hear stories read is 26.6, a difference of 10.20. The critical ratio of 7.79 is very significant and indicates a virtual certainty that those pupils who prefer to read their own stories will make a higher score in mental imagery than those who prefer to listen to stories read.

TABLE XVI - ASSOCIATIONAL RECALL VERSUS IMAGERY SCORE

Association	No.	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74
None	109	26	14	12	11	9	12	8	8	6	2	1	0	0	0	0
One Type	150	0	7	6	17	15	25	19	19	15	8	7	6	3	1	2
More than one type	211	0	0	1	7	9	12	29	27	38	20	20	18	14	5	11

● indicates the mean

Association	No.	Mean	S.E. M	Diff.	S.E. Diff.	Critical Ratio
None	109	17.9	± 1.32	13.3	± 1.77	7.52
One Type	150	31.2	± 1.15	-----	-----	-----
One Type	150	31.2	± 1.15	12.3	± 1.52	8.10
More than one type	211	43.5	$\pm .953$	-----	-----	-----

In Table XVI will be noted the frequencies of the scores in mental imagery versus the number of associations the pupils had while reading. One hundred nine pupils were reminded of nothing, had no association whatsoever. As it will be noted, their mean score in mental imagery is 17.9. One hundred fifty pupils had one type of association, such as a book previously read. Their mean score is seen to be 31.2. Two hundred eleven pupils had more than one type of association, such as a book read, or movie seen, or places visited, or people known. Their mean score is observed to be 43.5. The critical ratios, 7.52 and 8.10, respectively, are very significant.

In Table VI will be noted the frequency of the

score in mental imagery versus the number of associations

the pupils had while reading. One hundred nine pupils

were reminded of nothing, had no association whatsoever,

as it will be noted, their mean score in mental imagery

is 14.6. One hundred fifty pupils had one type of association,

such as a book previously read. Their mean score is seen to

be 17.3. One hundred eleven pupils had more than one type

of association, such as a book read, or words seen, or picture

skipped, or people known. Their mean score is observed to be

23.6. The critical ratios, 7.52 and 6.10, respectively, are

very significant.

TABLE XVII - PREFERENCE IN KIND OF STORIES
VERSUS IMAGERY SCORE

Kind of Stories Liked Best	No. Of Pupils
1. Adventure	106
2. True	90
3. Mystery	83
4. Fairy	51
5. History	47
6. Wild West and Cowboys	44
7. The Funnies	26
8. Animals	23
Total	470

Kind of Story Preferred	Mean Score Imagery
Adventure	40-44
Mystery	35-39
Animals	35-39
True	30-34
History	30-34
Fairy	30-34
Wild West and Cowboys	25-29
The Funnies	15-19

TABLE VIII - PRESENTATION IN KIND OF EXPORTS
TOWARD JEWELRY GOODS

Kind of Jewellery in kind	Value in millions
1. Diamonds	100
2. Ruby	50
3. Emerald	10
4. Sapphire	10
5. Pearls	10
6. Gold and Silver	10
7. Other Jewellery	10
8. Miscellaneous	10
Total	200

Kind of Jewellery in kind	Value in millions
1. Diamonds	100
2. Ruby	50
3. Emerald	10
4. Sapphire	10
5. Pearls	10
6. Gold and Silver	10
7. Other Jewellery	10
8. Miscellaneous	10
Total	200

In Table XVII is arranged in order of preference the kind of stories liked best. It can be seen that adventure stories are the first choice, with 106 pupils voting for them. From the 470 pupils in grades four, five, and six, only twenty-three voted animal stories as their first choice. Animal stories ranked lowest in preference.

In the second part of the table is arranged in high to low sequence the mean score in imagery received by those who preferred each kind of story. It will be noted that those who preferred adventure stories had the highest score in imagery, a score above the average mean score. Those pupils who liked the Funnies best had the lowest score in imagery, 15-19, which was very low in comparison with the average combined mean score in imagery of the 470 pupils, 34.6. The children who enjoyed best animal, true, history, and fairy stories had scores in imagery close to the mean of the combined grade imagery scores, as can be seen in the table.

In Table VII is arranged in order of preference the

kind of stories liked best. It can be seen that adventure

stories were the first choice, with 100 pupils rating them.

From the 470 pupils in grades four, five, and six, only twenty-

three voted animal stories as their first choice. Animal stories

were second in preference.

In the second part of the table is arranged in order of

preference the mean scores in history received by those who

preferred each kind of story. It will be noted that those who

preferred adventure stories had the highest scores in history.

A score above the average, mean score, those pupils who liked

the animal best had the lowest score in history, 35-40, while

was very low in comparison with the average grade mean score

in history of the 470 pupils, 56.5. The children who enjoyed best

animal, true, history, and fairy stories had scores in history

close to the rest of the combined grade history scores, as can

be seen in the table.

TABLE XVIII - 35 WHO DIDN'T LIKE TO READ

VERSUS AMOUNT OF READING
 VERSUS KIND OF READING
 VERSUS ASSOCIATIONAL RECALL

Amount of Free Reading

Amount	Little 0-4 books	Average 5-9 books	Much 10 and above
No.	34	1	0

Kind of Reading

Kind	Adventure	True	Mystery	Fairy	History	Wildwest & Cowboys	Funnies	Animals
No.	5	6	3	6	3	6	6	0

Associational Recall

Association	None	One	More
No.	19	10	6

The data in Table XVIII show the amount of free reading, the kind of reading liked best, and the associations of the 35 pupils who did not like to read.

It is noted that 34 of the 35 pupils had not read more than 4 books, and that 19 of the 35 pupils had absolutely no association while reading. However, it is observed these pupils were quite evenly divided in preference for kind of stories, with the exception of animals. None of them liked animal stories best.

TABLE XIX - 26 PUPILS WHO PREFERRED FUNNIES

VERSUS AMOUNT OF READING
 VERSUS ASSOCIATIONAL RECALL
 VERSUS LIKING TO READ

Amount of Reading

Amount	Little 0-4 books	Average 5-9 books	Much 10 and above
No.	18	6	2

Associational Recall

Association	None	One	More
No.	14	9	3

Liking to Read

	Yes	No
No.	20	6

REPORT NUMBER ON 1177 68 - 1177 68

STATION TO TOWN 31.11
 STATION TO TOWN 31.11
 STATION TO TOWN 31.11

Station to town

Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town

Station to town

Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town

Station to town

Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town
Station to town	Station to town	Station to town	Station to town

In Table XIX is presented some data of the 26 pupils who preferred the Funnies. While the numbers are too small to warrant reliability in the data, yet the table is presented for the interest it may contain.

Of the 26 pupils who preferred the Funnies, 18 of them had **not** read more than 4 library books. Fourteen of the 26 pupils had no association whatever when reading the test passages. Twenty of them said, however, that they liked to read.

CHAPTER IV

INTERPRETATIONS AND IMPLICATIONS

CHAPTER V

CHAPTER V

INTERPRETATIONS AND IMPLICATIONS

U. S. G. P. O. No. 100, 000, 000

By Act of Congress, the United States Government,
Washington, D. C., 1900, No. 100, 000, 000

CHAPTER V

THE SUPPLEMENTARY AND THE FURTHER

CHAPTER V
INTERPRETATIONS AND IMPLICATIONS

Interpretations

It is possible, that, in the previous search for cause or causes of children's inefficient silent reading abilities, educators have overlooked the contribution which mental imagery may make in improving silent reading.

In many talks with individual children during this study, the writer found that many were unaware that they had mental pictures accompanying thinking or reading. They had never thought about imagery at all. Pear says, "Some persons may be more conscious of their confinement in imagery, if confinement it be" than others.^{1/}

Ernest Cobb, the co-author of many delightful and much enjoyed books for children, believes that "no thought takes place except in connection with a mental picture".^{2/}

Others disagree with this theory, but yet are firm believers in the power of mental imagery. Betts stated in the

^{1/} T. H. Pear, op. cit., p. 363.

^{2/} Ernest Cobb, The Mind's Eye, Arlo Publishing Company, Newton Upper Falls, Mass., 1941, p. 13.

THE UNIVERSITY OF CHICAGO

It is possible, that, in the present search for
 causes of cancer of children's alimentary tract
 children, who have been treated the conditions which
 would have been in the past with which
 in any case with the children of children during this
 study, the writer found that many were unaware that they had
 never given the necessary attention to reading. They had
 never thought about history at all. Some persons
 may be sure to notice of their condition in history, it

consequently it is then that

Ernest Cobb, the son-in-law of many distinguished and
 such enjoyed both the children, children and the history
 taken place except in connection with a mental picture.
 When history with this theory, had not been
 subjects to the power of mental history. While stated in the

1/2. In fact, at all, p. 222.

2/2. In fact, at all, p. 222. The University of Chicago, Chicago, Ill., 1911.

conclusions of his dissertation that "imagery often serves as a background for the meaning with which we are dealing, but it cannot be said to be essential to meaning" ^{1/}

Fernald reported evidence tending to show that "when a process becomes habitualized, it may be performed without the aid of any imagery and a minimum of consciousness of any sort" ^{2/}

It is the writer's opinion that most children are capable of some degree of imagery, that some children are aware of it and use it as an aid to thought, that other children do not know or appreciate the power of imagery, its uses, its accompaniments. While thinking may take place without imagery, correct images may be used to clarify thought, and inaccurate images may lead to wrong ideas and misconceptions.

Although both children and adults may be able to read without imagery, think without it, act without it, yet, if they possess it, their purposes, activities, and lives may become more enriched, more fruitful, and meaningful.

The writer agrees with Lay^{3/} who believes the mental image is of value in our education, as an awakening of our finer emotions, and that it will "appear when we receive our earliest mental training, namely, in our reading, writing, and arithmetic" ^{4/}

^{1/} George H. Betts, op. cit., p. 94.

^{2/} Mabel R. Fernald, op. cit., p. 136.

^{3/} Wilfrid Lay, op. cit., p. 56.

^{4/} Ibid., p. 57.

If mental imagery can be an asset, educators, interested in the best possible development for each child, should be able to diagnose by a simple test in what degree each child possesses it.

A simple analysis, such as the writer gave in the group test, determined the presence or absence of mental imagery, and detected the wide range possessed by individuals in each classroom. This is noted in Table IV. To shorten the time required to find the variance in imagery, the writer would suggest a more informal method of marking the test papers, which for all practical applications, would serve the purpose, and discover the presence or absence of imagery, classifying the pupil as high, good, average, below average, or very poor in imagery.

Although these tests were given to children of widely differing experiential background, although the selections for the tests were different for each grade, yet the mean scores for each grade varied very little, (Table IV), from the mean score of the combined grades, (Table III). This would appear to indicate that chronological age does not apparently affect the imagery score, that as the child advances in grade level, he is not receiving training which is increasing his score in mental imagery.

There were a few more boys than girls in grade IV. In grade VI, there were a few more girls than boys. The distribution is shown in Table I. The very slight increase in score in grade VI,

If any of the group can be so named, a number, indicated in the text, for the development of the child, should be made to distinguish by a single fact in which it was such child possessed in a single analysis, such as the effect, was in the group, and, determined the presence or absence of mental activity, and collected the child's response by individual tests in the classroom. This is done in Table IV. To obtain the data, the child is in various in groups, the other would suggest a word for each method of testing the test, which, which for all practical application, would have the purpose, and discover the presence or absence of the group, identifying the child as high, good, average, below average, or very poor in language. Although these tests were given to children of widely differing intellectual background, through the application for the tests were different for each grade, yet the same scores for each grade varied very little, (Table IV). From the mean scores of the combined grades, (Table III), this would appear to indicate that intellectual age does not necessarily affect the language score, that as the child advances in grade level, he is not receiving training which is increasing his score in mental language. There were a few more boys than girls in grade IV. In grade V, there were a few more girls than boys. The distribution is shown in Table I. The very slight increase in score in grade V,

(Table IV), may possibly be attributed to this difference, as the findings indicate the girls possess superior imagery.

When one examines Table VI for sex differences, one is interested to observe that in all three grades the girls made higher scores in imagery than the boys.

These differences possibly may indicate one of the reasons why boys seemingly have more trouble than girls in learning to read, why there are more reading disability cases among boys than girls.

For years, educators have been interested in this problem. Dr. Durrell^{1/} found in his study of 1130 children that retarded reading was twice as frequent among boys as girls. "Among six thousand children given the Durrell-Sullivan Reading Capacity and Achievement Tests, 18 percent of the boys were retarded as compared to 9 percent of the girls".^{2/}

Many causes have been advanced for these differences which appear very early in first grade, such as contrast in interests and activities, and differences in readiness for reading. It may be possible that lack of an equal amount of mental imagery may affect the boys' ability in visual and auditory discrimination, which is one of the fundamental requirements

^{1/} Donald D. Durrell, Reading Disabilities in the Intermediate Grades, Unpublished Doctor's Dissertation, Harvard University, 1930.

^{2/} Donald D. Durrell, Improvement of Basic Reading Abilities, World Book Company, New York, 1940, p. 281.

in learning to read, and thereby contribute to confusion.

It may be in the middle grades that lack of mental imagery brings faulty percepts and thus leads to erroneous ideas and meanings.

The indoor and outdoor selection, which comprised the test for each grade, was entirely different in content and imagery possibilities, yet considering these facts, it can be seen from Table VII, that there was a fairly good correlation between the scores received on both types of selections.

The writer believes that the child's experiential background did have an influence in the child's imagery. Some pupils failed to see in their mind's eye a picture from one selection, yet could obtain a mental picture from the other selection. A number of children remarked, "I can't see anything in my mind after reading this". However, when the second passage was presented, they did see a picture, and vice versa.

The type of selection, influenced by associations, experiences, previously built concepts, evidently does have an effect on the imagery score, but the fact that there was a fair positive correlation indicates pupils can develop comparable mental images from different types of selections,

is known to hold, and thereby contribute to the correlation.
It may be in the middle grades that most of mental imagery
arises from the sensory and thus leads to erroneous ideas
and mistakes.

The indoor and outdoor selection, which concerned
the test for each grade, was entirely different in content
and imagery possibilities, yet combining these tests, it
can be seen from Table VII, that there was a fairly good
correlation between the scores received on both types of
selection.

The writer believes that the child's experiential
background did have an influence in the child's imagery.
Some pupils failed to see in their child's eye a picture from
one selection, yet could obtain a mental picture from the
other selection. A number of children remarked, "I can't see
anything in my mind after reading this." However, when the
second passage was presented, they did see a picture, and
vice versa.

The type of selection, influenced by associations,
experience, previously held concepts, evidently does have
an effect on the imagery score, but the fact that there was
a fair positive correlation indicates again that the
imagery and mental images for different types of selection.

such as were used in this study.

Evidently mental age has very little effect on mental imagery. The slightly positive correlation (Table VIII) was exceedingly low. As the mental age increases, there evidently is no corresponding increase in imagery. The girls did show a slight growth (Table VI), but there was no increase in the boys' scores. If there were growth in imagery, with increase in mental age, one would expect to see a greater variation in the mean scores indicated in Table IV. The number of 105 cases, used for comparison of mental age with imagery score, was too small to warrant any conclusions.

The writer would like to see a comparison of the scores in I. Q. with mental imagery.

When one looks at the correlation of reading age with mental imagery, Table IX, one gets a different picture, a positive correlation of .53. The number of cases, 175, is small; however, Table X tells much the same story, showing the frequencies of the scores of mental imagery versus the different reading ability groups.

At present, in the majority of schools, pupils in each grade are divided into three ability reading groups for certain reading exercises and activities. Sometimes there are ten little groups; sometimes all come together in one group for

certain purposes and activities.

The character and kind of reading in the intermediate grades gradually shifts in objectives from learning to read to reading to learn for various purposes. The pupil discovers how to use books as tools of learning in broadening his pleasures, interests, tastes, and skills. Meanings, concepts, associations are developed, and enriched through his reading. From Tables IX and X, it appears that skill in intermediate grade reading and mental imagery do show correlation.

The power a child has in mental imagery seemingly affects his reading skill, or does it? Does his reading skill affect his imagery as well? It seems probable that successful reading in the middle grades may depend on imagery as one of the important factors.

The training in the various sense imageries has been advocated by R. P. Halleck, who advises that "all the imageries of children be cultivated before the impressionable age is past".^{1/}

From the total number of 470 children tested, 435 expressed real joy in reading. They liked to read. Only 35 said they really did not get any pleasure from reading. Table XI graphically tells the story in relation to their imagery scores. The mean score in imagery of those who liked to read is 35.5.

^{1/} Wilfrid Lay, op. cit., p. 54.

Do those 435 children enjoy reading because of their substantial imagery, or do they have a high score in imagery because they like to read? Perhaps both. It is very probable, however, that their enjoyment in reading comes largely from the imagery accompanying their reading.

They are successful in reading, probably. Interest and success are correlating factors, not only in school achievement but in life's endeavors as well. Three hundred forty-four children composed the two highest ability groups in reading. They probably enjoyed reading, as there were but 35 who expressed a dislike for the subject.

If children, who make a high score in mental imagery, are the ones who like to read the best, it must be that these mental pictures, when used to help clarify thought and build correct percepts and concepts, are a desirable accompaniment to reading.

The scores made in imagery by the children who dislike reading, (Table XI), hold tremendous implications for teachers, educators, and publishers of childrens' books. Those 35 children who disliked reading have a mean score in imagery of 16.00. Their poor imagery very probably contributed in large measure to their dislike for reading.

One little girl, pupil no. 41, who scored a total

To these 55 children, and the presence of their individual
interest, or do they have a high degree of interest because they
like to read? Further data. It is very probable, however, that
their enjoyment is reading comes largely from the interest
accompanying their reading.

They are accustomed to reading, probably. Interest
and interest are correlated factors, not only in school
achievement but in life's endeavor as well. These hundred
twenty-four children represent the two highest ability groups
in reading. They probably enjoyed reading, as there were not
35 the average of children for the school.

Of children, who were a high level in reading ability,
are the ones who like to read the best, it may be that these
small pictures, who tend to read early, quickly and well
control, perhaps and more so, are a desirable recommendation
to reading.

The scores made in reading by the children who dislike
reading, (Table II), and are a recommendation for teachers,
educators, and publishers of children's books. These 55 children
who dislike reading have a mean score in reading of 11.33.
Their poor reading was probably contributed in large measure to
their dislike for reading.
The little girl, pupil no. 41, is marked a total

of 12 in imagery said, "No picture, because I don't remember the words after I say them. They go away. I see nothing, I hear nothing in a picture. You see, I read one word and have to study the next, so everything goes. We have hard stories about the Pilgrims, so I get discouraged".

This little girl evidently had poor imagery, and was struggling with material not suited to her level of ability. Imagery possibly cannot accompany reading which is too difficult.

Another pupil, no. 37, whose total score in imagery was 13, remarked, "I don't like to read. I get a little picture, but it goes right away again. I forget awful easy. If teacher tells me something, I think I have it, but I forget right away. I don't know why".

If imagery contributes to enjoyment of reading, if imagery contributes to success in reading, if it can be developed through training, as those who have made investigations believe it can, then activities, exercises, and books for its development should be provided.

Children who read many books, probably enjoy reading, or they would not read a large number. Pupils, who do much free reading, score high in imagery. From Table XIII it can be noted that the pupils, who read ten books and more, (a few of the 470

read 40 books), had a mean score in imagery of 47.8, 13.2 points higher than the average mean score for the combined groups. Those who read less than four books scored 24.0 in imagery.

A child who reads a large number of books, suited to his reading level, increases his eye span, speed, fluency, and improves his techniques, word mastery, comprehension, and vocabulary. In addition, wide reading broadens his tastes, his experiences, increases his pleasure, extends his interests, and leads to purposeful activities.

The writer believes that a child enjoys his reading because of the imagery accompanying it. There are other very important factors essential to interest. In this discussion, however, it is the part imagery plays which is of primary concern.

Interest and the amount of reading, therefore, seem to be correlating factors. If a child is to improve his imagery, he should read more books than he is reading, books which are suited to his level of ability, to his interests, and to his needs.

Associational reading is one of the important kinds of reading needed for success in the middle grades. It is the type of reading in which the reader thinks along with the author, making comparisons, generalizations, finding similarities and

most of books, had a mean score in literacy of 47.8, 12.2 points higher than the mean score for the combined groups. Those who read less than four books scored 54.0 in literacy. A child who reads a large number of books, attains a high reading level, improves his eye-hand, speed, fluency, and improves his comprehension, word knowledge, general knowledge, and vocabulary. In addition, with reading develops his senses, his experiences, increases his interests, and adds his interests, and leads to purposeful activities.

The writer believes that a child enjoys his reading because of the imagery accompanying it. There are other very important factors essential to literacy. In this discussion, however, it is the part imagery plays which is of primary

importance.

Imagery and the amount of reading, therefore, come to be a reciprocal factor. If a child is to improve his literacy, he should read more books than he is reading, books which are suited to his level of ability, to his interests, and to his

needs.

Imaginative reading is one of the important kinds of reading needed for success in the future. It is the type of reading in which the reader shares along with the author, active experiences, sensations, feelings, and emotions.

exceptions to his viewpoint, and relating his own experiences to those of the author. This reading, while always important, is a special aid in social study courses.

Some children make few comparisons when reading. They have no ideas along with the author. They fail to link their experiences to what is being read.

Table XVI tells a very interesting story. It reveals the fact that those pupils, who had absolutely no association, while reading either selection, of either a book read, movie seen, place visited, or people known, have a mean score in imagery of 17.9. It is very possible that the ability to do associational reading depends upon imagery in large measure. Those who had one type of association, have a mean imagery score of 31.2. The pupils, who had more than one type of association, have a mean score in imagery of 43.5.

Associational reading ability is something which can be improved through training. Avis Marden found that, by preparing specific exercises designed to improve this ability, remarkable results could be observed in eight weeks.^{1/} The writer believes that exercises designed for improving imagery would also improve associational reading.

^{1/} Avis Marden, Associational Reading Abilities of the Seventh Grader, Unpublished M. Ed. Thesis, Boston University, 1941.

Let us compare the mean score in imagery of those who did not like to read, 16.00, with the mean score of those who had no association while reading either selection, 17.9. It can be seen there are many interrelations.

In the appendix, page 126, may be noted some of the types of associations the pupils made while reading the selections.

It is very important that a pupil get a correct mental picture. False images mean misconceptions, wrong interpretations.

A child's previous experience helps to build ideas, meanings, and images. Horn says, "When the words or statements in the text are familiar to the reader and stand for ideas that he has previously evolved from his experience, the recall of these ideas is relatively easy. Sometimes, indeed, he may not have the vaguest ideas of what the words themselves mean."^{1/}

Ambiguous, confused concepts lead to error in interpretation. "Vagueness and errors in the background pertinent to any selection are certain to be reflected in the meanings that are obtained."^{2/}

In the outdoor selection, presented to grade V pupils, page 34, one reads that Teddy Bear, while walking upon a mountain, fell through a thick fringe of blueberry bushes, and went rolling

^{1/} Ernest C. Horn, Methods of Instruction in the Social Studies, Charles Scribner's Sons, New York, 1937, p. 177.

^{2/} Loc. cit.

and clawing down the face of a steep rock. He fell thirty feet into a deep bowl, not more than forty feet across at the bottom.

Some of the conceptions and images of this deep bowl in the woods where Teddy Bear fell may be seen in the appendix, page 121. One third of the 144 grade V pupils tested had similar conceptions of a deep bowl in the woods. The passage gave description of the rocky sides, Teddy falling 30 feet, the bowl forty feet across at the bottom, but to one-third of the pupils a bowl could have but one meaning, a dish. Pupil no. 26 says, "The clearest part of this picture is the bear in the dish."

On page 120 of the appendix may be seen two diagrams of pupils who had a correct idea of the "deep bowl in the woods".

Betts reiterates the importance of experiential background for forming correct visual pictures. "Children up to these ages 13 to 18 show few traces of any other kind of knowledge, but think mainly in visual pictures, their mental life being chiefly made up of imagination and memory of their personal experiences."^{1/}

Dr. Durrell says associational types of reading "involve skills of a somewhat higher level than simple interpretation."^{2/} He suggests exercises for enriching imagery in silent reading as a

^{1/} George H. Betts, op. cit., p. 85.

^{2/} Donald D. Durrell, Improvement of Basic Reading Abilities, op. cit., p. 244.

and clearing from the top of a narrow road. The fall thirty feet
into a deep pool. His body was thirty feet below the surface.
Some of the circumstances and nature of this deep pool in
the woods where the body fell may be seen in the appendix, page 121.
The third of the 144 pupils mentioned in similar connections
of a deep pool in the woods. The passage gave description of the
body when, forty feet below the surface, the body lay face down at
the bottom, and in a position of the body a head would have had
one meeting, a slight, slight, or, as they say, "the slightest part of
this picture is the scene in the lake."

In page 122 of the appendix may be seen two pictures
of pupils who had a narrow view of the "deep pool in the woods".
Better pictures the importance of experimental back-
ground for future correct visual pictures. "Children up to
thirteen years of age are not able to see the other side of knowledge,
but think only in visual pictures. Their world is being
objectively related to a world which is not visual."

Dr. Russell gave experimental tests of visual pictures. "Pupils
of a not much higher level than the kindergarten."
No more experimental tests for children than for the reading class.

W. Russell, 1900, op. cit., p. 121.

Dr. Russell, 1900, op. cit., p. 121.
op. cit., p. 121.

means of improving associational reading.^{1/}

There is no doubt in the writer's mind that imagery helps to build associations which in turn assist in recall and form a basis for learning and retention.

Mabel Fernald decided that, "the presence or absence of associations between images was again and again --- the determining factor for the learning of a series".^{2/}

The importance of the correlation of imagery and associational recall cannot be too strongly stressed.

The type of reading, the kind of reading a child does depends largely on his imagery, (Note Table XVII). The children who prefer the Funnies more than any other kind of reading are children with a very low imagery score. Their imagery score is not low because they like the Funnies. Perhaps these children with poor imagery need these pictures and turn to them because of the visual aid given in helping to increase pleasure through imagery already provided for them.

However, children who liked adventure stories have the highest imagery scores. This type of reading provides much in the way of mental pictures through sound words, color words, motion, kinesthetic and emotional coloring.

^{1/} Loc. cit.

^{2/} Mabel Fernald, op. cit., p. 138.

means of having associated reading. ¹
 There is no doubt in the writer's mind that imagery
 helps to build associations which in turn assist in recall and
 form a basis for learning and retention.
 Label Verbal decided that, "the presence or absence of
 associations between letters and words -- the determining
 factor for the learning of a word." ²
 The importance of the contribution of imagery and
 associations will cannot be too strongly stressed.
 The type of reading, the kind of reading a child does
 depends largely on his imagery, (see Table VII). The children
 who prefer the symbols more than any other kind of reading are
 children with a very low imagery score. Their imagery score is
 not low because they like the symbols. Perhaps these children
 with low imagery score have their pictures and thus do not become
 of the visual aid given in helping to learn the symbols through
 imagery already provided for them.
 However, children who liked written symbols have the
 highest imagery scores. This type of reading provides much in
 the way of mental pictures through sound words, color words,
 motion, etc. which is not available coloring.

¹ See, esp.

² Label Verbal, op. cit., p. 120.

In these days of the radio, motion picture, records, visual aids, much is done in providing imagery for the child. There can be no doubt of the tremendous educational value of these learning aids.

However, the writer believes that if, by diagnosis, it is found that a child preferring comics and the Funnies has a low imagery score, much can be done to increase imagery through intelligent guidance.

If teachers and parents discover children whose preference in reading taste is the Funnies, they can help to improve their imagery by encouraging them to read fairy, history, true, mystery, and adventure stories. It cannot be done by taking away the comics and the Funnies. Such a restriction would be disastrous. The comics are here to stay.

Pertinent to this thought is the advice of Dr. Gray. "The stimulation of wide reading of books and selections should be chosen with special reference to the interests and the needs of children rather than the cultivation of appreciation of specific literary masterpieces selected largely in harmony with adult standards."^{1/}

^{1/} William S. Gray, "Symposium", Policies and Practices in Reading, Reprinted from the Elementary English Review of November, December, 1942, and February, 1943, by National Council of Teachers of English, Chicago, Illinois, p. 12.

In these days of the radio, motion pictures, records, visual aids, and the like in providing history for the child, there can be no doubt of the tremendous educational value of these historical aids.

However, the writer believes that it, by itself, is not enough to have a child studying records and the teacher has a few history books, such can be done to increase history through intelligent selection.

If teachers and parents discover children whose preference is reading books in the history, they can help to increase their history by encouraging them to read history, history, time, history, and literature stories. It cannot be done by taking away the books and the teacher. From a restriction would be disastrous. The books are there to stay.

For this reason, it is the opinion of W. Gray, "The stimulation of wide reading of books and selections should be chosen with special reference to the interests and the needs of children rather than the cultivation of appreciation of special literary masterpieces selected largely in harmony with the child's age."

W. Gray, "Stimulation and Selection in Reading," *Journal of the American Library Association*, Vol. 1, No. 1, 1922, and *Library Journal*, Vol. 27, No. 1, 1922, p. 12.

Among these 26 children, preferring the Funnies, no one had an individual **imagery** score above 44, although the range in imagery was from 0 - 74. The 13 individuals, who scored in the highest step-interval between 70 - 74, liked best adventure, mystery, true, and fairy stories. Not one of this top group in imagery preferred wild west, cowboy stories, or the Funnies.

In a study made by Dr. Gates, the elements of surprise or unexpectedness, liveliness or action, were those which ranked first in influencing interest in children's reading.^{1/} Adventure and mystery stories abound in these elements.

Of the 26, who preferred the Funnies, 18 had not read more than 4 library books, (Table XIX). Their poor imagery evidently did not contribute to enjoyment and pleasure in reading, although 20 of them said they liked to read. If they really liked to read, however, they would read more. Fourteen of these pupils had no association whatever in reading the passages given in the test. Of course, the number of pupils, 26, is too small to draw any conclusions. The data are simply presented for the interest they contain.

However, the findings do hold implications. It will not be solving the problem to place a ban on the Funnies. It will not increase these youngsters' imagery to decide they should have

^{1/} Arthur I. Gates, Interest and Ability in Reading, The Macmillan Company, New York, 1931, p. 80.

only these 22 children, protecting the animals, as one
 and an individual category score above 60, although the range in
 category was from 0 - 74. The 22 individuals, who scored in the
 highest category (category 70 - 74, which was extremely
 category, from, and being extreme. Not one of this group in
 category put out wild west, cowboy stories, or the fun in
 the study made by Dr. Jones, the elements of surprise
 or unexpected, the children's reactions, with those which tended
 that in this group interest in children's reading. The
 and category stories found in their elements.

Of the 24, who preferred the animals, 18 had not read
 more than 6 story books, (Table A). Their story category
 category did not contribute to enjoyment and pleasure in reading.
 although 22 of them said they did so read. It was really
 liked to read, however, they would read more. Perhaps of these
 pupils had an excellent idea of what the category given
 in the test. Of course, the number of pupils, 22, is too small
 to draw any conclusions. The data are slightly weighted for the
 interest they contain.

However, the findings do hold implications. It will not
 be possible to provide to place a pen on the animal. It will
 not increase these youngsters' ability to decide they should have

no visual aids, or illustrations. That would indicate a misunderstanding of the best means to the end. Of the 470 children, 438 said they preferred stories with illustrations.

It would be exactly like saying, that because some children use the context to the exclusion of other means of attacking words, that teachers should not allow the pupils to use the context. It is not that they use the context too much, but that they use other clues too little. The implication is that these children have too little of other types of material, not that they have too many illustrations or visual aids.

There is little difference in the mean imagery score of those pupils who preferred a story as a motion picture, and those who indicated they liked better to listen to the same story over the radio. Table XIV shows a difference between the means of 2.6. In looking at the movies, the child is being given the aid of visual imagery in addition to auditory suggestions. Over the radio, through auditory aids, the child has to supply himself his own visual pictures. It appears that the child, who is able to create his own visual pictures, has slightly better imagery. The mean score of the pupils preferring the radio, 36.1, is 1.5 higher than the mean imagery score of the combined grades.

Seventy-eight percent of the pupils preferred the movies. The mean score of these pupils was slightly lower than

no visual aids, or illustrations. That would include a number of the best books in the field. Of the two children, 528 said they preferred stories with illustrations. It would be exactly like saying, that because none of them has the books in the collection of other means of reading, that teachers should not allow the pupils to use the books. It is not that they use the books too much, but that they use other things too little. The implication is that these children have had little or other types of reading, not that they have too many illustrations or visual aids. There is little difference in the mean category score of those pupils who preferred a story as a written picture, and those who indicated they liked to listen to the same story over the radio. Table III shows the difference between the mean of 3.4. In looking at the graph, the child is being given the aid of visual memory in addition to auditory suggestions. For the radio, through auditory aids, the child has to supply himself his own visual picture. It appears that the child, who is able to create his own visual picture, has slightly better memory. The mean score of the pupils preferring the radio, 35.1, is 1.5 higher than the mean category score of the combined grades. Twenty-eight percent of the pupils preferred the radio. The mean score of those pupils was slightly lower than

the mean imagery score of the combined grades. These pupils, preferring the movies, however, are close to the average in imagery.

The pupils, who indicated a preference in reading their own stories, have a substantially higher imagery score than those who prefer to hear some one read the stories to them. The difference between the means is 10.20.

Many factors other than imagery, of course, influence such a difference. Some children read with too much difficulty in word recognition and comprehension, and at too slow a rate for enjoyment. Seventy-four percent, however, prefer to read their own stories. Their mean score in imagery of 39.2 indicates strong ability in different kinds of imagery.

It is possible that some children find difficulty in imagery without the auditory aid. Pupil, no. 21, said, "I have to say the words out loud in order for the thought to click. No picture unless I say the words".

This may have strong implications for those who have said there shall be no lip movement during silent reading. The serious effects of lip movements in successful silent reading are well known. However, it may be that a few children find imagery and meaning difficult without "saying the words". There may be some way of helping such pupils, if diagnosis reveals poor imagery.

The encouragement of much relatively easy and interesting

The main literary source of the medieval tradition, these legends, presenting themselves, however, are closer to the story in history. The legend, as I indicated a previous in regard to their own history, is not a substantially higher literary source than those who prefer to keep some and read the others as they are. The difference between the names is 10.20.

Any legend which is more, of course, influenced such a difference. Some legends and (or) such difficulties in word and meaning and content, and at the same time for enjoyment. However, the legend, not only, but it is read their own history. The legend source in history of 10.20. In addition, the legend is different kinds of history.

It is possible that some children and adults in history without the history and, finally, no. 21, said, "I have to say the word and find in order for the legend as child. In legend unless I say the word."

This may have strong legend and the lines who have said that will be in the legend during their reading. The legend of the legend is successful in legend and legend. However, it may be that a few children and legend and legend. There may be some say of legend and legend. The legend is legend and legend.

material would no doubt help not only to stimulate fluency, speed, and cultivate interest, but also to increase imagery as well.

Enjoyment of reading, the amount of reading, success in reading, the kind of stories liked, associations in reading, and reading one's own stories, all show substantial correlations with imagery scores.

material waste no doubt has not only to be eliminated from the
process, but also to be eliminated from the
the whole.

In view of the fact, the amount of waste, success
in teaching, the kind of exercise used, and the kind of
and teaching are not equal, all these important considerations
with proper regard.

THE
THE
THE

Implications

For Measurement of Pupils

1. Early diagnosis of pupils' imagery by means of a test similar to the one used in this study is recommended. A scale for measurements of the degree of imagery can be constructed. However, an informal method of scoring may be adopted by classifying the pupils into five groups of imagery; high, good, average, below average, and poor.
2. A comparison of each pupil's imagery score (or rating, if the marking system, high, good, average, below average, or poor is used) with his interest in reading, amount of free reading accomplished in a year, kind of stories liked best, and associational recall would be very useful for determining each pupil's needs.
3. Discovery of personality differences is suggested through analysis of responses to questions in the test, the introductory questions, and observation of kind of stories preferred. The shy and retiring pupil, the aggressive pupil, the social child, the discouraged pupil, and the optimistic pupil will be discovered.

For Teaching

1. The writer believes that power in mental imagery, in relation to silent reading, would respond to training.
2. Exercises may be developed for teaching pupils to observe and improve their own imagery, and keep a record of their own improvement.
3. Small group work can be initiated, according to the needs and interests of the pupils. Some pupils may need help in all kinds of imagery; some may need help chiefly in visual imagery.

Pupils who prefer the Funnies, if their imagery score is low, can be grouped for special work in diagnosing and discussing imagery possibilities in selections.

Development of taste for other kinds of stories, which would increase efficiency in imagery, can be made.

Teachers must not condemn the Funnies, for that practice would defeat the object in view. Intelligent guidance is needed. Dr. Gates says, "Many of the classics do not make an appeal to many children, especially the poorer readers. The popularity of the comics and of the modern adventure serials is obvious both in children's choices of reading materials and radio programs. Damage is sometimes done by the

1. The writer believes that power is not a luxury, but a necessity for efficient teaching, and this response to teaching.
2. Teachers may be developed for teaching pupils to observe and improve their own learning, and keep a record of their own improvement.
3. The I group work can be initiated, carried on to the end and interest of the pupils. Some pupils may need help in all kinds of learning; some may need help chiefly in visual learning.
4. It is the teacher's function, in their own way, to help, and to guide the pupils in their work in learning and to encourage their possibilities in achievement.
5. Development of pupils for other kinds of learning, which would increase efficiency in learning, can be made.
6. Teachers may not compare the function for that.
7. Teachers may not reject the object in view. The object in view is needed. Dr. Foster says, "any of the classics do not make an appeal to every student."
8. The necessity of the classics and of the modern advanced studies is obvious.
9. Both in children's choice of reading materials and in the program, there is a need for the

restrictive influence of the school on free and recreational reading".^{1/}

4. Free reading of library books can be guided with a better understanding of suggesting books for pupils, who are poor in imagery.

Believing that the amount of free reading increases a pupil's imagery, the writer suggests that the classroom teacher innovate schemes, and plans which will stimulate the amount of free reading of library books on the level of ability of the child, and according to his interests.

Dr. Gates says, "Now that the picture newspapers and magazines, the radio, phonographs, and other sources of information are available, the incentives for continuing to read in adult life are less than they were a generation ago. We need a larger amount of lusty, challenging, and satisfying content for our literary courses and free reading periods, especially for boys".^{2/}

5. Exercises can be initiated for promoting imagery in associational reading.

^{1/} Arthur I. Gates, "Symposium", Policies and Practices in Reading, Reprinted from the Elementary English Review of November, December, 1942, and February, 1943, by National Council of Teachers of English, Chicago, Illinois, p. 10.

^{2/} Loc cit.

6. Special training may be given to the boys who show definitely lower ability in imagery than the girls. It would be interesting to observe whether or not this training would result in greater efficiency in reading ability.
7. A program, coordinating in a better way the promotion of imagery, the clarification of concepts, increasing a meaningful vocabulary, and studying semantic variations of words, is suggested. "One of the strongest new emphases in improving reading instruction should be in the field of semantics".^{1/}
8. Practice in observation of characteristics in writing in books which tend to promote imagery would help to increase the pupil's own imagery.
9. Practice may be given in increasing imagery in the pupil's own compositions, both oral and written.
10. Use of maps, charts, diagrams, and the making of simple diagrams, in connection with silent reading, is suggested to help increase imagery.

^{1/} Nila B. Smith, "Symposium", Policies and Practices in Reading, Reprinted from the Elementary English Review of November, December, 1942, and February, 1943, by National Council of Teachers of English, Chicago, Illinois, p.26.

6. Special attention may be given to the type who shows relatively lower ability in language than the girls. It may be interesting to observe whether or not this individual would be in greater difficulty in reading of ability.
7. A number, corresponding to a better way the presentation of language, and classification of concepts, increasing a vocabulary vocabulary, and writing narrative variations of words, is suggested. "One of the strongest new methods in the study of reading instruction should be in the field of narrative." 1
8. Practice in observation of observations in writing in books which tend to provide literary world help to increase the child's own language.
9. Practice may be given in increasing ability in the child's own composition, both oral and written.
10. Use of maps, charts, diagrams, and the making of simple diagrams, in connection with story reading, is suggested to help increase language.

1 W. S. Smith, "Vocabulary, Fluency and Comprehension in Reading," Harvard Educational Review, 1942, by National Society, December, 1942, and February, 1943, p. 23. Journal of Research of English Education, Illinois, p. 23.

For Further Research

1. Repetition of this same experiment under better controlled conditions. By pairing the boys and girls in mental age, a better determination of the sex differences could be approximated.
2. Repetition of this same experiment showing the sex differences in every comparison, associational recall, liking to read, story preferences, and amount of reading.
3. Development of a standardized test for diagnosing mental imagery in silent reading.
4. Development of improved objective scoring standards.
5. Creation of exercises for increasing imagery followed by tests to determine the effect of training in mental imagery.
6. Discovery of the earliest and most favorable time for training in mental imagery.
7. Comparison of the I. Q. quotients with mental imagery.
8. An analysis of speed in reading with degrees of ability in imagery.
9. Controlled experiment to compare the similarities and differences in adult's and children's imagery in relation to their silent reading.

1. Repetition of this same experiment under better controlled conditions. By varying the room and style in which the subject is seated, the effect of the sex difference would be ascertained.
2. Repetition of this same experiment under the same conditions as above, but with a very different, associated recall, such as a poem, story, or reference, and amount of training.
3. Division of the subject into two groups for different mental imagery in effect training.
4. Repetition of the experiment with varying standards.
5. Question of experiment for increasing imagery followed by tests to determine the effect of training in mental imagery.
6. Memory of the subject and how far it is affected by training in mental imagery.
7. Comparison of the E. G. condition with mental imagery.
8. An analysis of speed in training in terms of ability in imagery.
9. Controlled experiment to compare the subject's and his friends in adults and children's imagery in relation to their ability training.

10. An experiment, extending over several years, to increase children's power of imagery. Tests, given at intervals, to determine whether or not the training was permanent. Observation and testing of the same subjects in Junior High School, Senior High School, and later as adults.

For Authors and Publishers of Children's Books

1. A series of books, which have as their chief object, development of power in mental imagery in silent reading. A series of workbooks with practice exercises to increase imagery, and tests at intervals which will serve to show pupil and teacher the improvement.
2. Adventure stories and mystery stories, with their elements of surprise, plot, and liveliness, which give such vivid appeal to all the sense perceptions, particularly visual, auditory, and kinesthetic, are the choice of the pupils who have higher scores in imagery than pupils preferring other kinds of stories. This should suggest a series of books for pupils in grades four, five, and six.

10. An experiment, extending over several years, is
 necessary to determine the power of memory. Tests, given
 at intervals, to determine whether or not the
 learning was permanent. Observation and testing of
 the same child was in Junior High School, Junior High
 School, and later in college.

For children and adolescents of different ages

1. A series of tests, which have as their chief object,
 development of power in mental history in different
 periods. A series of tests with practice
 exercises in various languages, and tests at intervals
 which will serve to show child and teacher the
 improvement.

2. Advanced studies and exercises, with their
 elements of grammar, logic, and mathematics, which
 are made vivid through to all the senses through logic,
 particularly visual, auditory, and kinesthetic.
 are the objects of the pupils who have higher scores
 in the series than pupils who have lower scores of
 scores. The studies are given in series of scores
 for pupils in grades four, five, and six.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The findings are as follows:

1. The significant differences in water content are found in the first, third, and fifth.
2. The girls in all three classes, however, have higher scores in weight than the boys.
3. The weight and the chest size of girls varied with age. The same is true for boys.
4. The weight and chest size of girls varied with age. The same is true for boys.
5. The weight and chest size of girls varied with age. The same is true for boys.
6. The weight and chest size of girls varied with age. The same is true for boys.

THE
LAW
OF
THE
STATE

BY

THE
STATE

CHAPTER VI

SUMMARY AND CONCLUSIONS

A scale was constructed for measuring the mental imagery of the 470 pupils who were subjects in this study. It revealed the wide range of imagery present in the silent reading of pupils in grades four, five, and six.

The data were analyzed to discover some of the specific factors that might show positive, negative, or no correlation with a high or low degree of mental imagery present in silent reading.

The findings are as follows:

1. No significant differences in mental imagery are found in grades four, five, and six.
2. The girls in all three grades, however, have higher scores in imagery than the boys.
3. The mental age of a pupil shows no correlation with scores in mental imagery.
4. The reading age of a pupil shows a fair correlation with the degree of imagery present in silent reading.
5. Grouping of pupils, according to ability in reading, correlates with ability in imagery.

CHAPTER VI

ANALYSIS OF CORRELATIONS

A scale was constructed for measuring the quality of the 150 pupils who were subjects in this study. It revealed the wide range of literary present in the study. Reading of pupils in grades four, five, and six. The data were analyzed to discover some of the specific factors that might show positive, negative, or no correlation with a high or low degree of mental literary present in silent reading.

The findings are as follows:

1. No significant differences in mental literary present in grades four, five, and six.
2. The girls in all three grades, however, have higher scores in literary than the boys.
3. The mental age of a pupil shows no correlation with scores in mental literary.
4. The reading age of a pupil shows a fair correlation with the degree of literary present in silent reading.
5. Grouping of pupils according to ability in reading, correlated with ability in literary.

6. Interest in reading shows a very decided correlation with the degree of imagery.
Those who do not like to read have correspondingly low scores in imagery.
7. The amount of free library reading likewise indicates a very definite correlation with the degree of imagery. Those who read many books have keen imagery; those who read few books have poor imagery.
8. The pupils, who preferred to read their own stories, have very much more power in imagery than those who prefer to hear stories read.
9. Those pupils, who have ability in associational recall have superior mental imagery. The pupils, who had no association with selections read, show very poor scores in imagery.
10. Very little difference in imagery rating is shown by those pupils who prefer a story in the "movies" and those who prefer a story on the "radio". Both groups have average scores in imagery. Those who like the radio best are slightly superior in imagery.

6. Interest in reading shows a very decided correlation with the degree of literacy. Those who do not like to read have correspondingly low scores in literacy.
7. The amount of free literature available in the library is very closely correlated with the degree of literacy. Those who read very much have been found to have those who read few books have poor literacy.
8. The people who are most interested in reading, have very low scores in literacy. These people who prefer to read fiction and stories, have very low scores in literacy.
9. Those people who have ability in association with literacy have higher literacy. The people who are not so associated with association have very poor scores in literacy.
10. The difference in literacy is very high in those by those people who prefer a story in the "action" and those who prefer a story on the "action". Both groups have average scores in literacy. Those who like the action are slightly superior in literacy.

11. The pupils, who liked adventure and mystery stories best, have the highest imagery scores. Those who liked the Funnies best, have the lowest imagery score.
12. A fair positive correlation between the indoor and outdoor selection indicates that pupils can develop comparable mental images from different types of selections, such as were used in this study.

11. The results, who listed themselves and not very
 station part, have the highest category scores.
 Those who listed the English part, have the
 lowest category score.

12. A test positive correlation between the Indian
 and subject's station indicated that English
 can be used very easily in the English
 classification of education, such as were
 used in this study.

APPENDIX

The first part of the report is devoted to a description of the data and the methods used in the analysis. The second part contains the results of the analysis and the conclusions drawn from them.

The third part of the report is devoted to a description of the data and the methods used in the analysis. The fourth part contains the results of the analysis and the conclusions drawn from them.

APPENDIX

The fifth part of the report is devoted to a description of the data and the methods used in the analysis. The sixth part contains the results of the analysis and the conclusions drawn from them.

The seventh part of the report is devoted to a description of the data and the methods used in the analysis. The eighth part contains the results of the analysis and the conclusions drawn from them.

1900

THE
SCHOOL OF THE
MARTIN LUTHER KING, JR.

APPENDIX

On pages 118 - 122 may be noted reproductions of diagrams made by pupils in grades four, five, and six. They are included as a matter of interest.

The diagrams do not indicate the pupils' ability in mental imagery. Some pupils who were high in imagery made a poor diagram; others with high imagery made an excellent diagram indicating good concepts. However, those who were very poor in imagery, in general, had a correspondingly poor diagram. They, of course, had no image from which to make a sketch. Some of the imagery from the pupils' test papers are indicated beside the diagrams. Lack of space, however, prevented a complete report.

The sketches on page 121 are of interest. They are exact reproductions of grade V pupils' diagrams showing the bowl in the woods where Teddy Bear landed. (See page 34 for the selection.) One third of the fifth grade pupils had similar ideas of a deep bowl in the woods. On page 120 may be seen typical examples of diagrams of pupils who had a good concept of a bowl in the woods.

APPENDIX

On pages 118 - 122, are included reproductions of diagrams made by pupils in grades four, five, and six. They are included as a matter of interest.

The diagram is not intended to be a 'picture' of the mental imagery. Some pupils who were with in memory made a poor diagram; others with high memory made an excellent diagram illustrating their concepts. However, those who made very poor diagrams, in general, had a correspondingly poor diagram. That is, of course, not always true, which is made a record. Some of the memory from the pupils' words reports are indicated beside the diagrams. Lack of space, however, prevented a complete record.

The sketches on pages 121 are of interest. They are exact reproductions of Grade 7 pupils' sketches showing the bowl in the woods where they had been. (See page 84 for the selection. One third of the fifth grade pupils had similar ideas of a deep bowl in the woods. On page 120 are reproduced typical examples of sketches of pupils who had a good concept of a bowl in the woods.

No 54 Total Imagery Score = 74

(Outdoor)

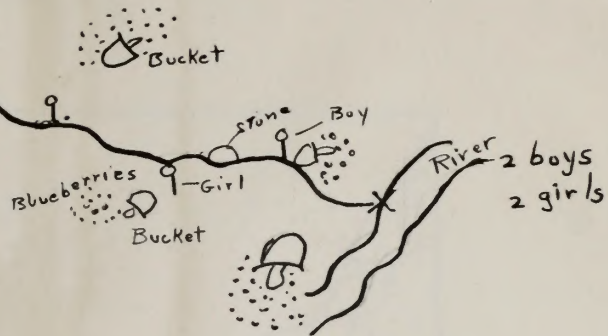
"Children running down hill
toward water.
Berries fly out when baskets go up
in air.
One boy trips over stones because
he is clumsy.

Sounds

Children yelling and talking
Footsteps
Brush crackling

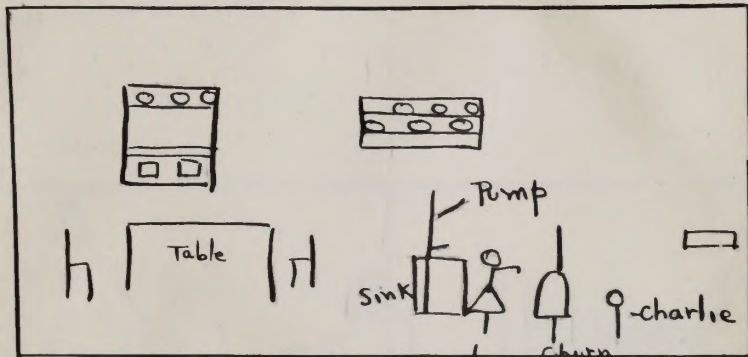
Colors

Red dress with white spots
Brown dress with flowers
Black pants with white stripes + white shirt
gray knickers, brown sweater
Green trees
Under brush green and brown



No 54 Total Imagery Score = 74

(Indoor)



Mrs. Brown
white dress
with green spots
Charlie
short brown pants
and yellow
shirt

Sounds

Beating of churn
Pump going
Pilot light snapped on stove
Footsteps in kitchen
Creaking of old floor

Odors

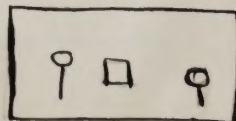
Butter, gingerbread maven
Chicken

Colors

Chairs brown
Stove black and cream
Cupboard cream with red stripes
Pump red
Sink white
Set tub with oilcloth of cream + red flowers
Linoleum hard to describe
Border of brown, orange, cream, green "

No. 41 Total Imagery Score = 9

(Indoor)



Colors - white shirt
Blue pants
Blue dress

Sounds -

None

Odors -

None

"Sometimes I see it and then
I don't"

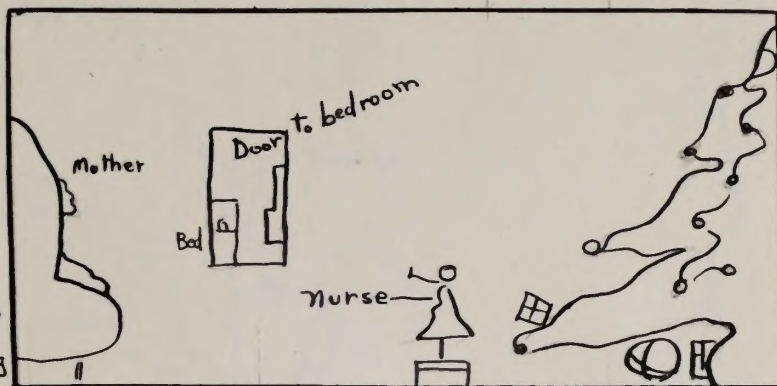
Grade V (Indoor)

119

No. 267 Total Imagery Score = 59

"Colors

Green tree
Yellow, red
blue, brown
lights
Nine color rug



Sounds

People whispering

Odors - Peppermint canes - candy

Taste - Peanuts - popcorn

3 People, Mother,
Nurse, Boysleeping "

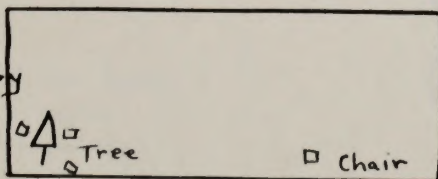
No. 235

Total Imagery
Score = 33



No. 26

Total Imagery
Score = 21



"See Xmas tree with presents

Hazy picture

Can't see bedroom

Colors - Green tree white trimmings

Sounds

None

Odors

None

Tastes

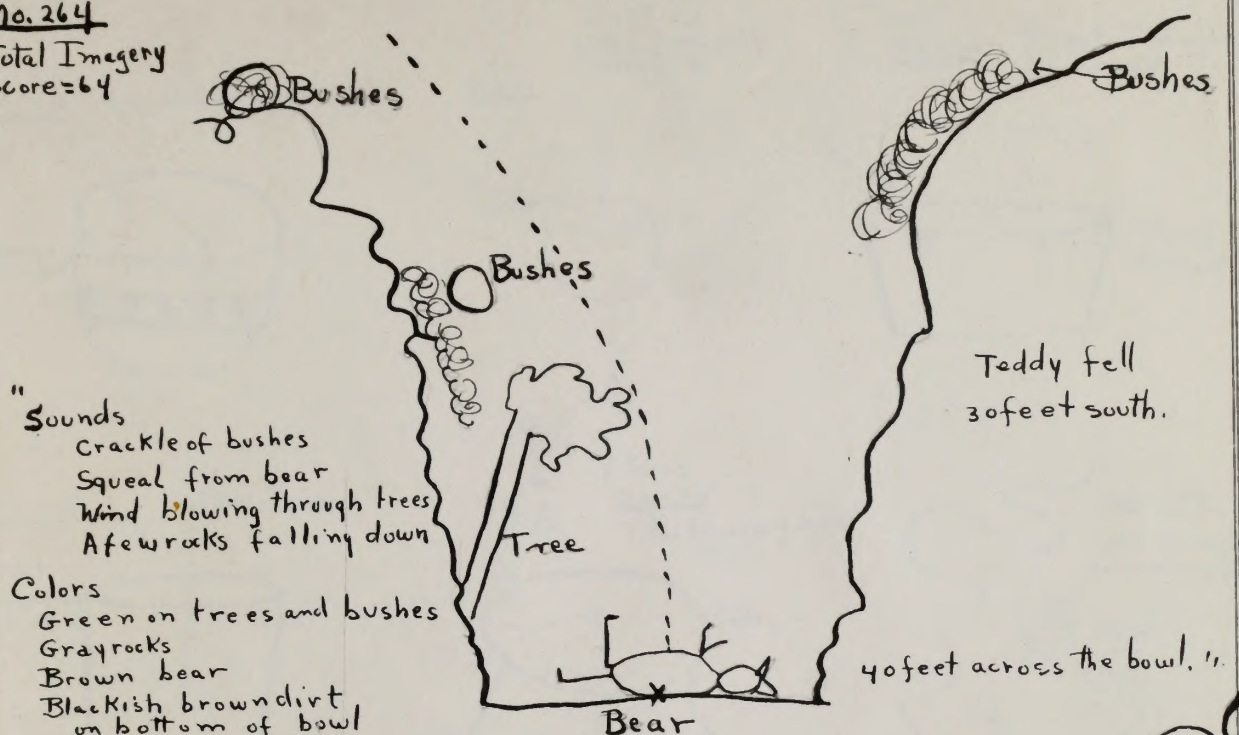
None "

Grade V (Outdoor)

120

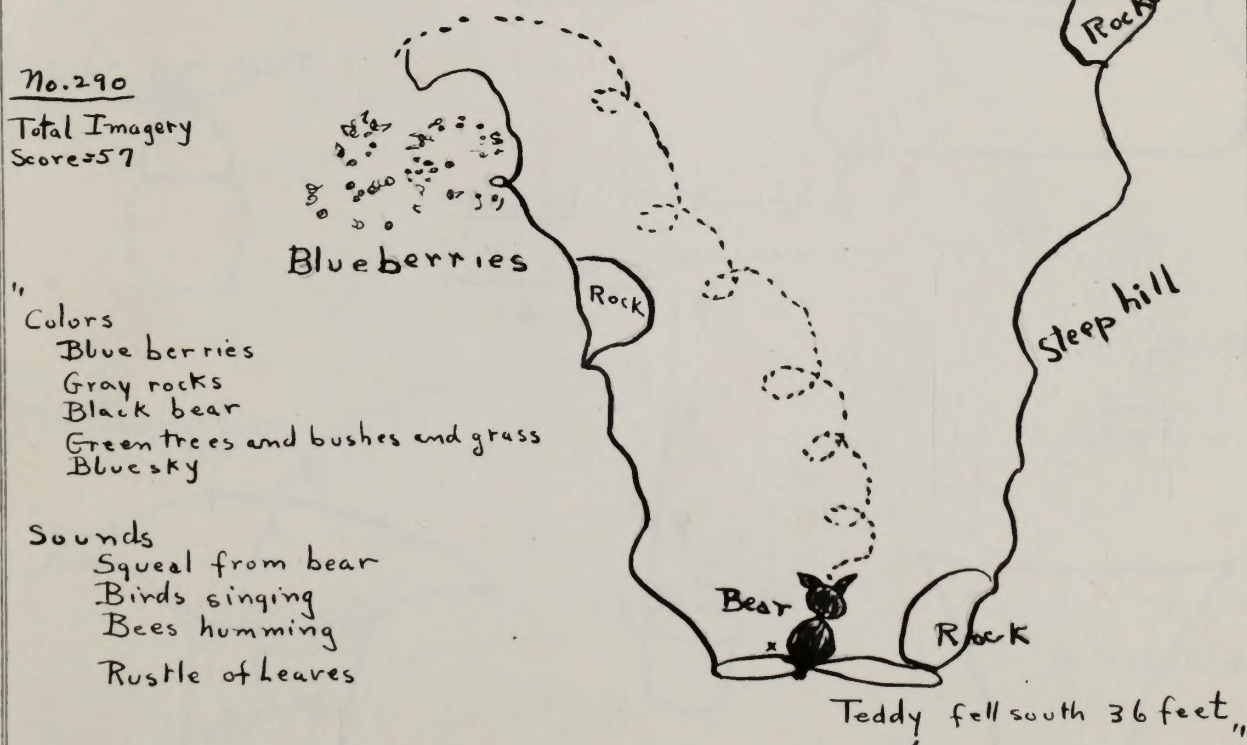
No. 264

Total Imagery
Score=64



No. 290

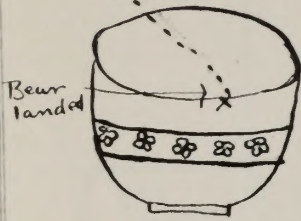
Total Imagery
Score=57



Grade V (Outdoor)

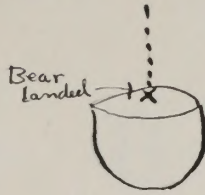
121

No. 25 Total Imagery score = 15

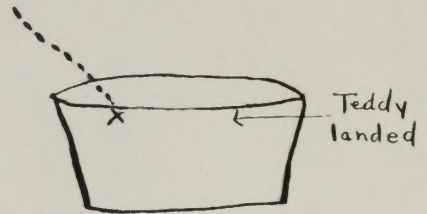


No. 21

Total Imagery Score = 8



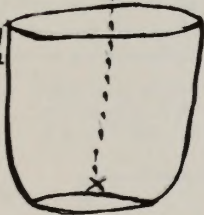
No. 268 Total Imagery Score = 66



No. 296

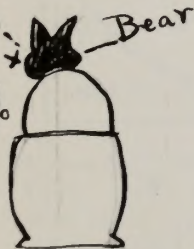
Total Imagery Score = 12

Teddy Landed

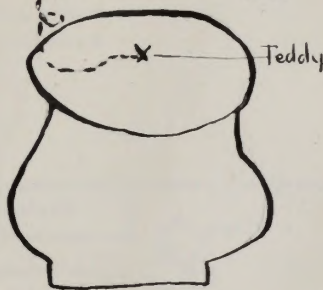


No. 236

Total Imagery Score = 40

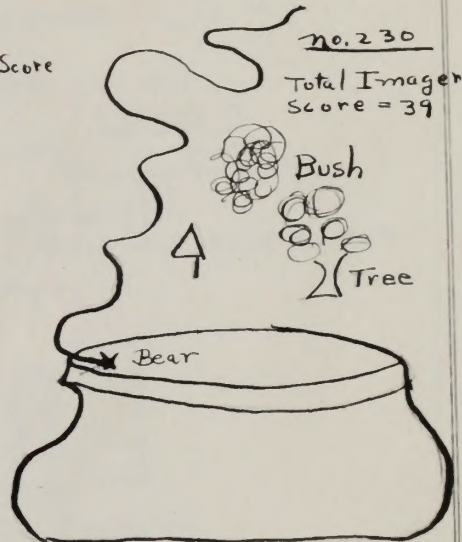


No. 228 Total Imagery Score = 52

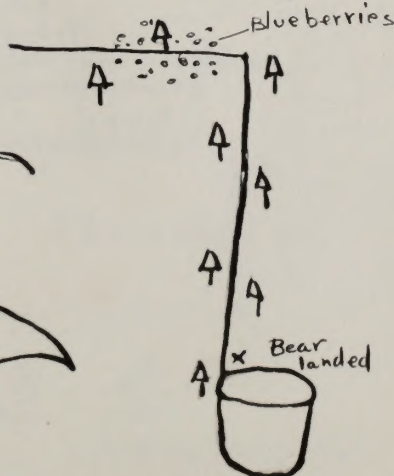


No. 230

Total Imagery Score = 39

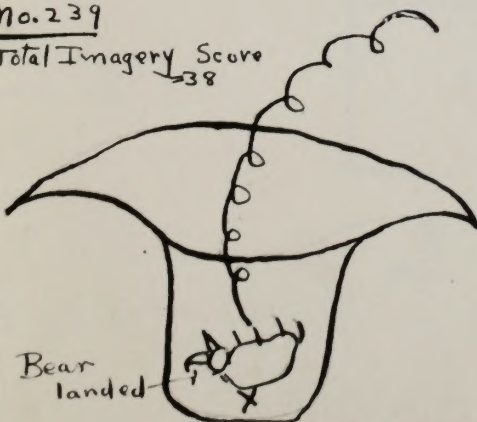


No. 237 Total Imagery Score = 47



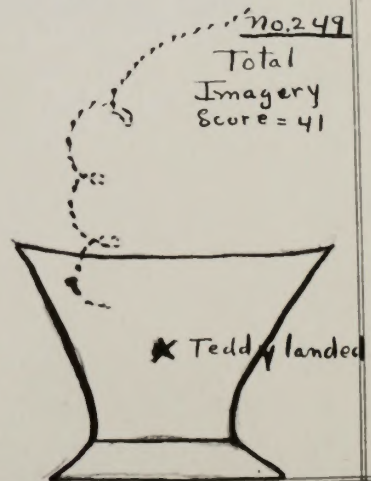
No. 239

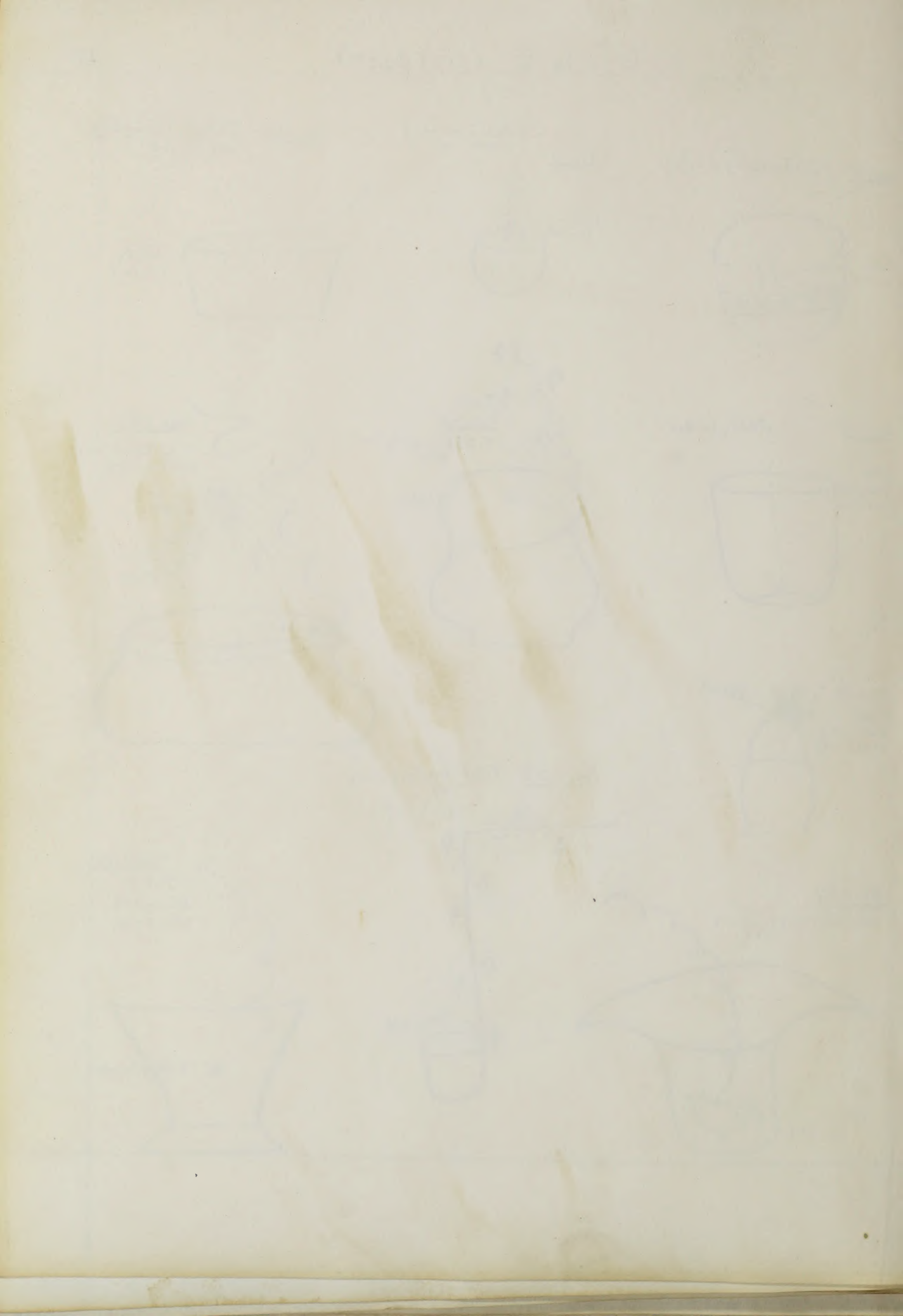
Total Imagery Score = 38



No. 249

Total Imagery Score = 41

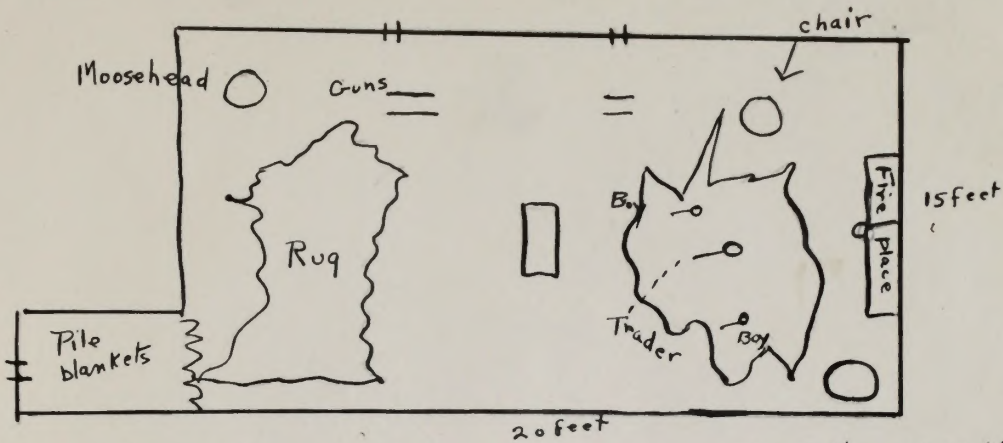




Grade VI (Indoor)

122

No. 9 ^{Total} Imagery score 58



" Trader telling stories to 2 boys
Indian blankets on walls and on floor
Fire burning and crackling in the fireplace
Kettle of soup hanging in fireplace
Table set to eat in front of fireplace
Guns on walls

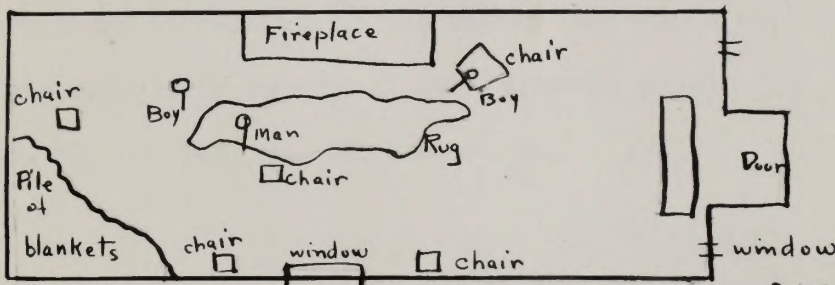
3 people ages 16-15-48

Colors-
Boys-1 bluesuit
1 brownslacks
red sweater
Trader-Black pants
Brown leather jacket
Brown table
Brown guns
Red, orange, green blankets "

Sounds- Talking of people
walking of people
crackling of fire

No. 362

Total Imagery
Score 67



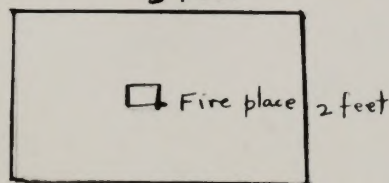
Colors- Brown suit on man and one boy
Blue suit on other boy
Red blue, yellow blankets
Red, orange, yellow glow from fireplace
Dark red, dark blue colored chairs

3 people
ages 13-15-50

Sounds- winter clothing
crackling of fire
Laughter of man and boys
wind howling, shutters
banging "

No. 5

Total Imagery
Score 13



Man boy

" See boy in room with trader & fireplace
No colors
No sounds

Boy 11-
Man 30-

I don't get pictures when reading except once in awhile and they are not clear."

On the next page are reported, verbatim, individual pupil responses which are of interest and hold implications for teachers and educators. They are shown in relation to the mental imagery score. Note especially remarks of the following pupils: no. 21, no. 244, no. 37, and no. 41.

On the next page are reported, verbatim,
 individual pupils' responses which are of interest and
 hold implications for teachers and students. They
 are shown in relation to the central inquiry scene.
 Note especially trends of the following pupils:
 no. 21, 22, 23, 24, 25, and no. 26.

INDIVIDUAL PUPIL RESPONSES

Pupil No.	Imagery Score	Responses
12	6	"Can't see a thing in this indoor picture. The other picture was hazy gray".
10	0	"No colors do I see unless the story says so".
5	13	"I don't get pictures when I am reading except once in a while and they are not clear".
7	7	"Sometimes I get a picture, sometimes none".
21	8	"I have to say the words out loud in order for the thought to click. No picture unless I say the words".
26	21	"The clearest part of this picture is the bear in the dish".
244	18	"I hear the words in the story, but I see very little picture".
216	37	"Sometimes I get colors, sometimes I don't".
37	13	"I don't like to read. I get a little picture but it goes right away again. It doesn't stay. I forget awful easy. If teacher tells me something, I think I have it, but I forget right away. I don't know why".
39	10	"I just get something black - no picture".
41	12	"No picture because I don't remember the words after I say them. They go away. I see nothing. I hear nothing. You see, I read one word and I have to study the next, so everything goes. We have hard stories about the Pilgrims and I get discouraged".
58	37	"I like best murder stories like the Ellery Queen".

On pages 126 - 127 may be observed a few responses, reported verbatim, showing the different types of associations the pupils had while reading the selections. Table XVI indicates the relation of associational recall to imagery score.

"Sun Valley Serenade" was the only moving picture reported by name. Several pupils said the selection reminded them of a movie but did not recall the name.

Very many books were reported, a few of which are included in the responses. It would appear that when children read their own stories the imagery produces better associations than when the imagery is already provided for them in a movie. Perhaps the imagery is more permanent. Table XV shows the mental imagery of pupils who preferred to read their own stories in relation to the imagery of those who preferred to hear stories read.

INDIVIDUAL PUPIL RESPONSES RELATING TO ASSOCIATIONAL RECALL

Books	Movies	Indoor Places	Outdoor Places	People
Mother West Wind's Children	Sun-Valley Serenade	Miss Symme's Kitchen	Woods I Visited in Rocky Mts.	Naughty child reminds me of my cousin
Splitthoof		Old fashioned kitchen on a farm I visited	Woods near my home	The nurse is like my grandmother
Buffalo Bill		Kitchen at my uncle's farm	Woods up in the country	My little brother
The Young Forester		My mother's kitchen	White Mountains' Trading Post	The nurse looks like my mother
With the Indians in the Rockies		My cousin's bedroom	Linenburg Look-Out Tower	Mrs. Brown looks like my aunt
College on Horseback		My brother's bedroom	Like a place I go in the country	Charlie reminds me of my cousin in the country
Grey Light		My aunt's bedroom		The trapper is like an Indian I've seen
Smoky		My own bedroom		The children are like my playmates

book

back type

colored on greenish

in the middle
with the letters

the same character

the same will

the same

the same

the same will

the same

the same

the same

the same

the same

the same person

the same

the same

the same

the same

the same

the same

the same

the same person

the same

the same

the same

the same

the same

the same

the same

IDENTIFICATION NEED BE PROVED BY EXAMINATION OF THE DOCUMENTS

My Friend Jo Jo

Toto the Elephant

Andre

Miki

Rusty Pete

Facing the Word

Toby Tyler

The Invaders

My little nephew's
bedroom

Indian Museum in
Harvard, Mass.

My Father's Cabin
in the Hills

An Indian exhibit
I saw

A room up at camp

BIBLIOGRAPHY

Alexander, H. W. "Some Observations on Visual Imagery," Psychological Review (1904), XI, pp. 219-236.

Allport, G. W. "Ideatic Imagery," The British Journal of Psychology (October, 1914), IV, pp. 7-123.

Angell, A. E. "Methods for the Investigation of Mental Imagery," Psychological Review (November, 1913), XX, pp. 373-387.

Armstrong, A. C. "The Imagery of Arthur Schopenhauer," Psychological Review (1907), I, pp. 488-503.

Bartlett, F. C. "Imagery of Images," British Journal of Psychology (1906-07), XII, pp. 330-337.

Bentley, William. "The Imagery of Images," British Journal of Psychology (October, 1907), XII, pp. 1-10.

Bloch, Charles A. "Observations and Experiments on Mental Imagery," Dissertation, Columbia University, 1906, pp. 1-100.

Brown, Charles C. "A Study of Children's Imagery in Visual and Auditory Form," Dissertation, Columbia University, 1907, pp. 1-72.

Carroll, L. "Ideatic Imagery and the Visual Test," Journal of Experimental Psychology (1907), XII, pp. 251-257.

Cobb, William C. "The Mind's Eye, with the Imagery Imagery," Boston: G. P. Putnam's Sons, 1901, pp. 1-226.

Conley, E. C. "The Nature of the Mental Image," Psychological Review (1904), IV, pp. 124-132.

Cox, J. S. "Some Experiments on the Development of Imagery in School Children and the Influence of Individual Types and the Intensity of Interest in Learning to Write," Psychological Review (1906), XX, pp. 1-10.

UNIVERSITY

BIBLIOGRAPHY

- Alexander, H. B.: "Some Observations on Visual Imagery," Psychological Review (1904), XI, pp. 319-337.
- Allport, G. W.: "Eidetic Imagery," The British Journal of Psychology (October, 1924), XV, pp. 7-120.
- Angell, J. R.: "Methods for the Determination of Mental Imagery," Psychological Review Monograph Supplements (1910), XIII, No. 53, pp. 61-107.
- Armstrong, A. C.: "The Imagery of American Students," Psychological Review (1894), I, pp. 496-505.
- Bartlett, F. C.: "Functions of Images," British Journal of Psychology (1920-21), XI, pp. 320-337.
- Bentley, Madison: "The Memory Image," American Journal of Psychology (October, 1899), XI, pp. 1-48.
- Betts, George H.: Distributions and Functions of Mental Imagery, Doctor's Dissertation, Columbia University; 1909, pp. 1-99.
- Bremner, Marjorie C.: A Study of Children's Imagery in Visual and Auditory Comprehension, Unpublished M. Ed. Thesis, Boston University; 1938, pp. 1-79.
- Carmichael, L.: "Eidetic Imagery and the Binet Test," Journal of Educational Psychology (1925), XVI, pp. 251-252.
- Cobb, Ernest C.: The Mind's Eye, Arlo Publishing Company, Newton Upper Falls, Massachusetts; 1941, pp. 1-255.
- Colvin, S. S.: "The Nature of the Mental Image," Psychological Review (1908), XV, pp. 158-168.
- Colvin, S. S. and E. J. Myers: "The Development of Imagination in School Children and the Relation Between Ideational Types and the Retentivity of Materials Appealing to Various Sense Departments," Psychological Review Monograph Supplements (November, 1909), XI, No. 44, pp. 85-126.

- Durrell, Donald D.: Improvement of Basic Reading Abilities, World Book Company, New York; 1940, pp. 1-407.
- Durrell, Donald D.: Reading Disabilities in the Intermediate Grades, Unpublished Doctor's Dissertation, Harvard University; 1930, pp. 1-242.
- Drummond, Margaret: "The Nature of Images," British Journal of Psychology (July, 1926), XVII, pp. 10-19.
- Fechner, Gustav I.: Elemente der Psychophysik, Breitkopf and Härtel, Leipzig; 1860, pp. 1-565.
- Fernald, Mabel R.: Diagnosis of Mental Imagery, Doctor's Dissertation, University of Chicago; 1912, pp. 1-169.
- French, F. C.: "Mental Imagery of Students," Psychological Review (October, 1902), IX, pp. 40-56.
- Galton, Francis: Inquiries into Human Faculty and Its Development, Macmillan and Company, London; 1883, pp. 1-380.
- Galton, Francis: Statistics of Mental Imagery, Mind; 1880, 5, pp. 300-310.
- Gates, Arthur I.: "Diagnosis and Remediation in Reading," Policies and Practices in the Improvement of Reading, Reprinted from the Elementary English Review (November, December, 1942, and February, 1943), National Council of Teachers of English, Chicago, Illinois, pp. 46-51.
- Gates, Arthur I.: Interest and Ability in Reading, The Macmillan Company, New York; 1931, pp. 1-260.
- Gates, Arthur I.: "Symposium," Policies and Practices in the Improvement of Reading, Reprinted from the Elementary English Review (November, December, 1942, and February, 1943), National Council of Teachers of English, Chicago, Illinois, pp. 8-11.

- Gates, Arthur I.: The Psychology of Reading and Spelling, Teachers College, Columbia University, New York; 1922, pp. 1-106.
- Gray, William S.: "Symposium," Policies and Practices in the Improvement of Reading, Reprinted from the Elementary English Review (November, December, 1942, and February, 1943), National Council of Teachers of English, Chicago, Illinois, pp. 11-14.
- Griffitts, Charles H.: Individual Differences in Imagery, Doctor's Dissertation, University of Michigan; 1919, pp. 1-90.
- Hicks, G. Dawes: "On the Nature of Images," British Journal of Psychology (October, 1924), XV, pp. 120-148.
- Horn, Ernest C.: Methods of Instruction in the Social Studies, Charles Scribner's Sons, New York; 1937, pp. 1-523.
- Huey, E. B.: "Preliminary Experiments in the Physiology and Psychology of Reading," American Journal of Psychology (1897), IX, pp. 575-586.
- James, William: Principles of Psychology, Henry Holt and Company, New York; 1927, pp. 50-75.
- Keller, Helen: The World I Live In, The Century Company, New York; 1908, pp. 1-195.
- Lay, Wilfrid: Mental Imagery Experimentally and Subjectively Considered, Doctor's Dissertation, Columbia University; 1898, pp. 1-59.
- MacLennan, S. F.: "The Image and the Idea," Psychological Review (April, 1922), IX, pp. 69-79.
- Marden, Avis: Associational Reading Abilities of the Seventh Grader, Unpublished M. Ed. Thesis, Boston University; 1941, pp. 1-224.

Hesse, Arthur J.: The New Biology of Learning and Behavior,
 University of Chicago Press, Chicago, 1957.
 pp. 1-170.

Hess, William J.: "Symposium" on the Physiology of Learning,
 University of Chicago Press, Chicago, 1957.
 English Review (October, 1957), pp. 1-170.
 (1957), National Council of Teachers of English, Chicago,
 Illinois, p. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957.
 pp. 1-170.

Hess, William J.: "The Nature of Learning" English Journal
 of Psychology (October, 1957), pp. 1-170.

Hess, William J.: Psychological Differences in the Social Sciences,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

Hess, William J.: "Psychological Differences in the Physiology and
 Psychology of Learning" American Journal of Psychology
 (1957), pp. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

Hess, William J.: Psychological Differences in Learning,
 University of Chicago Press, Chicago, 1957, pp. 1-170.

- Pear, T. H.: "Privileges and Limitations of Visual Imagery," British Journal of Psychology (April, 1925), XV, p. 363.
- Petty, M. C.: "An Experimental Study of Certain Factors Influencing Reading Readiness," Journal of Educational Psychology (March, 1939), XXX, pp. 225-230.
- Secor, W. B.: "Visual Reading, A Study in Mental Imagery," American Journal of Psychology (1899), XI, pp. 225-236.
- Smith, Nila B.: "Symposium," Policies and Practices in the Improvement of Reading, Reprinted from the Elementary English Review (November, December, 1942, and February, 1943), National Council of Teachers of English, Chicago, Illinois, pp. 24-29.
- Titchener, Edward B.: A Textbook of Psychology, The Macmillan Company, New York; 1921, p. 59.
- Valentine, A. W.: "Functions of Images in Appreciation of Poetry," British Journal of Psychology (July, 1924), pp. 164-191.
- Vaughan, Wayland F.: General Psychology, Doubleday Doran Company, Inc., New York; 1936, p. 387.
- Wavle, Adra Soule: A Study of Mental Imagery in Silent Reading, Unpublished M. Ed. Thesis, Boston University; 1939, pp. 1-74.
- Winch, W. H.: "The Function of Images," Journal of Philosophical Psychology (1908), V, pp. 337-351.

Barry, T. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

Borley, W. P.: "The Psychology of the Individual," *Psychological Review*, 1923, 30, p. 105.

17
18

BOSTON UNIVERSITY



1 1719 02489 2764

